



# **SERVICE MANUAL**

## **Series 90 Single Price Venders**

January 1, 1992  
Beginning serial #0001-6000

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## **GENERAL INFORMATION**

## **VENDER SAFETY PRECAUTIONS**

**This service information is intended to be used by a qualified service technician, who is familiar with proper and safe procedures to be followed when repairing, replacing or adjusting any Dixie-Narco vender components. All repairs should be performed by a qualified service technician who is equipped with the proper tools and replacement components, using genuine Dixie-Narco factory parts.**

**Repairs and/or servicing attempted by uninformed persons can result in hazards developing due to improper assembly or adjustments while performing such repairs. Persons not having the proper background may subject themselves to the risk of injury or electrical shock which can be serious or even fatal.**

## MODELS & DETAILS

### DNCB 168

Height:	56-11/16
Width:	28-5/16
Depth:	29
Shipping Wt.:	462 lbs.
Capacity:	
Can, 12 oz.	174
10 oz. PLB	168

### DNCB 180

Height:	56-11/16
Width:	28-5/16
Depth:	30-1/2
Shipping Wt.:	462 lbs.
Capacity:	
Can, 12 oz.	190
10 oz. PLB	180

### DNCB 276

Height:	72
Width:	28-5/16
Depth:	30-1/2
Shipping Wt.:	573 lbs.
Capacity:	
Can, 12 oz.	282
10 oz. PLB	264

### DNCB 300

Height:	72
Width:	29 1/2
Depth:	30 1/2
Shipping Wt.:	536 lbs.
Capacity:	
Can, 12 oz.	300
10oz. PLB	300

### DNCB 348

Height:	72
Width:	37-1/16
Depth:	30-1/2
Shipping Wt.:	690 lbs.
Capacity:	
Can, 12 oz.	350
10 oz. PLB	328

### DNCB 360

Height:	72
Width:	37-1/16
Depth:	30-1/2
Shipping Wt.:	670 lbs.
Capacity:	
Can, 12 oz.	372
10 oz. PLB	348

### DNCB 368

Height:	72
Width:	37-1/16
Depth:	30-1/2
Shipping Wt.:	690 lbs.
Capacity:	
Can, 12 oz.	376
10 oz. PLB	352

### DNCB 414

Height:	79-1/2
Width:	37-1/16
Depth:	30-1/2
Shipping Wt.:	748 lbs.
Capacity:	
Can, 12 oz.	416
10 oz. PLB	396

### DNCB 432

Height:	79-1/2
Width:	37-1/16
Depth:	30-1/2
Shipping Wt.:	716 lbs.
Capacity:	
Can, 12 oz.	444
10 oz. PLB	432

### DNCB 440

Height:	79-1/2
Width:	37-1/16
Depth:	30-1/2
Shipping Wt.:	748 lbs.
Capacity:	
Can, 12 oz.	448
10oz. PLB	432

### DNCB 501T

Height:	72
Width:	37-1/16
Depth:	32
Shipping Wt.:	695 lbs.
Capacity:	
Can, 12 oz.	501
Bottle, 16oz. PLB	280

### DNCB 522T

Height:	72
Width:	37-1/16
Depth:	32
Shipping Wt.:	672 lbs.
Capacity:	
Can, 12 oz.	522
Bottle, 16oz. PLB	336

### DNCB 600T

Height:	79-1/2
Width:	37-1/16
Depth:	32
Shipping Wt.:	800 lbs.
Capacity:	
Can, 12 oz.	600
Bottle, 16oz. PLB	340

# PRODUCT WARRANTY

Dixie-Narco warrants to the purchaser of a Dixie-Narco unit all parts thereof (except light bulbs, fuses or finish) to be free from defects in material and workmanship, under normal use and service for a period of 12 months from the date of shipment from either our plant or warehouse.

All conditions as set forth in this Warranty apply also to the Dixie-Narco Dollar Bill Validator, which is warranted for 15 months based on the coded date on the serial plate of the Validator or 12 months from the date of shipment, whichever is greater.

Dixie-Narco's obligation under this warranty is limited to repairing or replacing without charge any part, including the Dixie-Narco Validator which, upon our examination and to our satisfaction, was defective in material or in workmanship and which failed under normal operating conditions and service.

The hermetically sealed refrigeration system (included in the machine), consisting of the motor compressor, condenser, evaporator and the refrigerant tubing, is warranted for a total period of 60 months from date of shipment of the vender.

The vend motor is warranted for a total period of 60 months from date of shipment of the vender.

The 60-month warranty does not apply to any electrical controls, fan motors, overload switches, starting relays, temperature controls, wiring harnesses, cabinet or finish. Dixie-Narco's obligation under this warranty on the sealed refrigeration system referred to above is limited to repairing and returning or replacing at Dixie-Narco's option any unit with a similar unit when, upon examination and to our satisfaction, it was determined to have been defective. If our examination reveals that the unit is inoperative because of a defective accessory, both cost of repairs and freight charges will be paid by the customer.

Dixie-Narco will pay transportation charges under this warranty on all parts replaced or repaired when transportation has been made in the most economical way. If special handling or special transportation is used or requested, the charges will be paid by the customer.

This warranty only applies to units located within the United States and Canada and when operated in normal conditions and with electrical power supplies of 110/120 volts, 60 cycle. Further, the warranty is voided when the serial number is missing or when a unit or any part has been subject to defacing, vandalism, misuse, neglect, alteration without proper authorization, accident or damage caused by transportation, flood, civil disorder, fire, or the Acts of God.

"Return Material Tags," indicating model number of unit, serial number and explanation of defect, must accompany all returned parts or units. "Return Material Tags" will be furnished upon request.

Effective Date: December 1, 1987, 0730

Reprint: January 1, 1992

# **INSTALLATION & SET-UP**

# **SERIES 90 CAN AND BOTTLE VENDER INSTALLATION & SET-UP**

## **RECEIVING INSPECTION:**

When the venders are received inspect them for any damage. If there is any damage, have the delivery driver note the damages on the bill of lading. According to I.C.C. regulations, shipping damage claims must originate with the consignee. Please advise Dixie-Narco as soon as possible if any shipping damage has occurred. Dixie-Narco will be happy to assist you if you must file a shipping damage claim.

## **UNPACKING THE VENDERS**

Remove the stretch wrap and top covers from the venders. If flavor labels were shipped with the venders they will be in an envelope taped to the back of a vender in the shipment.

**NOTE: DO NOT STORE THE VENDERS OUTSIDE WITH THE STRETCH WRAP ON.  
THIS COULD CAUSE THE STRETCH WRAP TO BOND TO THE VENDER'S  
SURFACE WHICH COULD DAMAGE THE FINISH.**

To open the vender, remove the shipping boards from the bottom of the vender. The shipping boards are fastened to the base with the leveling legs. Remove the shipping boards by removing the leveling legs to avoid damage to the leveling legs or the base. A 1½ inch socket type wrench can be used on the bottom of the leveling legs. The door lock keys will be found taped in the coin return cup. Remove the keys and open the vender door. Remove all internal packaging. Check the coin box on the door for any extra parts, pricing labels, or other information on any factory equipped accessories. Check the "T" handle for proper alignment and locking function. Check all lamps for proper function.

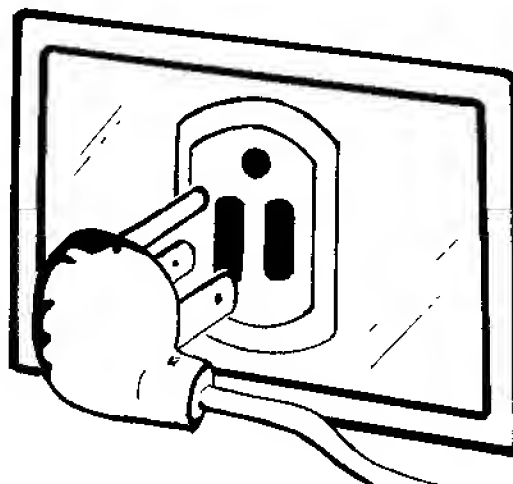
## **ELECTRIC POWER NEEDED**

The vender uses 115 volts single phase, 60 cycle, alternating current. The voltage must be between 103 and 127 volts. Look at the cabinet serial number plate to determine how much current the vender requires. Be sure the vender is plugged into a circuit which will provide correct amperage, with its own circuit protection (fuse, circuitbreaker). Do not use an extension cord.

## **GROUND THE VENDER**

The vender is equipped with a three wire grounded power supply cord. The vender must be plugged into a properly wired grounded outlet. **DO NOT REMOVE THE GROUND PIN OR USE ANY TYPE OF 3 PRONG TO 2 PRONG ADAPTOR.**

**WARNING:** Failure to comply with these instructions may subject the user to the risk of injury or electrical shock which can be serious or fatal.





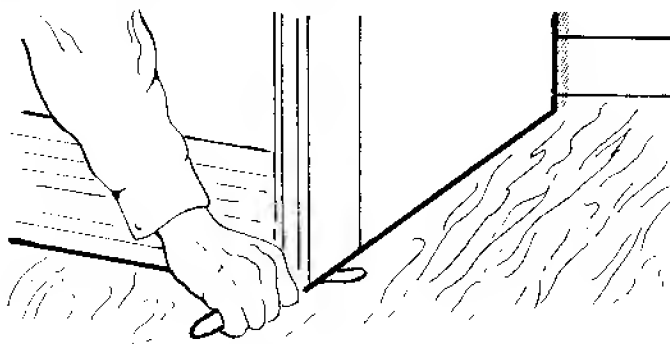
## PLACING THE VENDER ON LOCATION

**CAUTION: DO NOT TRANSPORT THE VENDER TO OR FROM THE LOCATION LOADED WITH PRODUCT OR DAMAGE TO THE VENDER MAY RESULT.**

The vender should be located on a solid, as flat as possible, surface. **CAUTION: Local loading under the leg levelers must be capable of 225 P.S.I.** The vender must be positioned close enough to an electrical outlet that an extension cord is not required. If securing the vender to the floor or wall is required, call the Dixie-Narco Service Department for securing suggestions.

## LEVEL THE VENDER

Level the vender. When the vender is level the door can be opened to any position and it will not move by itself. Try it half closed, straight open and wide open before deciding that the vender is level. Make sure that all of the leveling legs are touching the floor.



**DANGER:** The vender must be properly located and leveled to minimize the risk of injury or death from tip over in the event of user misuse or vandalism.

## SPACE THE VENDER

Do not block the rear of the vender. Maintain a minimum of 4 inches from the wall to provide adequate ventilation for the condenser and compressor. Also, in front of the vender, make sure that nothing obstructs the air intake at the bottom of the main door.

## LOADING THE VENDER

All Series 90 Venders are shipped ready to vend 12 oz. cans unless another package was specified at the time the vender was ordered from the factory. If a package other than a 12 oz. can is to be vended contact a Dixie-Narco Factory Service Representative, or refer to the proper Service Bulletin, for spacer settings and shims.

## INITIAL LOADING

Oscillators must be in the extreme left or right position to insure proper loading. When loading wide columns, the first row of cans should be loaded on the bottom bar of the oscillator. The second row of cans must be loaded on the top bar of the oscillator. Always load complete rows, do not load only to the back or only to the front of the column. Rotors must be in the "cup" position to receive the first cans. When loading narrow columns lay the rows in the column until the column is full.

Do not fill the columns to the top of the cabinet. Allow about 3 inches at the top of the column because the can stack will move up and down in the column during the vend cycle. Correct loading will prevent service calls and insure proper vending.

After loading a vender for the first time test vend each selection with money until the first can is delivered. This will ensure that the vender is loaded and working properly.

**NOTE: TO INSURE PROPER AIR FLOW THROUGH THE EVAPORATOR, DO NOT PLACE CANS (OR OTHER FOREIGN OBJECTS) IN THE BOTTOM OF THE TANK.**

## COIN CHANGERS AND OTHER ACCESSORIES

The Series 90 Vender must have a single price coin changer installed. Most styles can have a bill acceptor installed. If the coin changer and other accessories are not factory installed, refer to the instructions received from the manufacturer of the coin changer and other accessories for proper set-up and installation.

### INSTALLING A SINGLE PRICE COIN CHANGER

Set the vend price according to the instructions for the coin changer. Also, set the escrow mode in the coin changer to "Escrow To Price" and if required, set the coin changer for the proper bill acceptor interface. Hang the coin changer on its mounting panel and secure it by tightening the 3 securing screws. Plug the coin changer into the 8 pin Jones socket in the vender. Manually load all coin changer coin tubes with at least 10 coins each, and, "Prime" the coin changer by making one correct change transaction.

**NOTE: If a bill acceptor is being used the bill acceptor must be interfaced to the coin changer. Refer to the instructions provided by the manufacturer of the coin changer and the bill acceptor.**

The following single price coin changers will work properly with the Series 90 Vender.

MARS Electronics Int.		Coin Acceptors, Inc.		Crane International Currency	CONLUX-USA
TRC 6200	MC 5802	3340-S	S75-9400B-977	525E	US-111A-1
TRC 6200C	MC 5800	9340-S	S75-9800B-907	525C	US-111A-1D
TRC 6800	MC 5800 DH	9360-S		525EC	USA-121 A-OC
TRC 6800 H		9370-S		500	
TRC 6800 C		S300E9240		510	
TRC 6800 HC					

**\*NOTE: The Crane International models listed are not approved by CSA as of manual publication dates.**

### INSTALLING FLAVOR CARDS

The flavor cards are inserted into the selection buttons. To insert the flavor cards into the selection buttons swing the coin changer mounting plate away from the outer door exposing the back of the selection buttons. The flavor cards can be inserted into the back of the selection buttons from, either side. Ensure that the flavor cards are placed in the selection buttons that correspond to the columns the product is in.

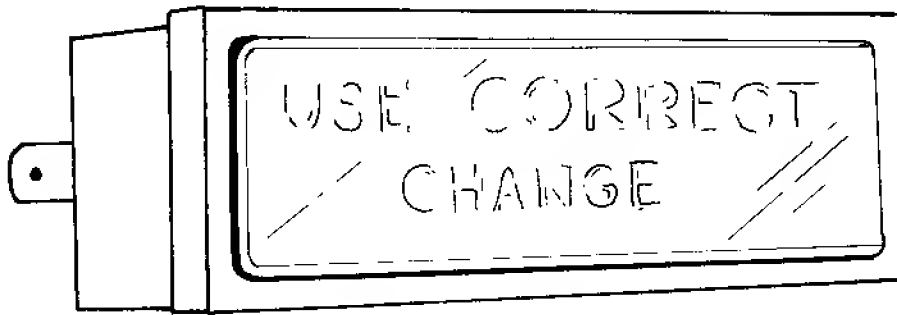
# — CHECK IT OUT —

WHAT TO DO	WHAT SHOULD HAPPEN
<p>Plug the power cord in.</p>	<p>The compressor runs, condenser fan runs, evaporator fan runs, "Correct Change Only" window lights and "Sold Out" lamps light.</p>
<p>Load a few cans into each column (above sold out).</p>	<p>Sold Out lights go off.</p>
<p>Close the vender door.</p>	<p>And</p>
<p>Put in correct change.</p>	<p>And</p>
<p>Push a select button.</p>	<p>Product is dispensed and delivered</p>
<p>If a dollar bill validator is used: Load the changer with at least 10-Quarters, 10-Dimes and 10-Nickels. Prime the coin changer, insert \$1 bill into validator.</p>	<p>Correct change is paid back.</p>
<p>Push a select button.</p>	<p>Product is dispensed and delivered.</p>
<p>Once the vender is placed on location, load the changer money tubes and fully load the vender with warm product.</p>	<p>Return to the vender the next day and check that a cold product is dispensed from each column; the first product vended has a temperature of 32° to 34° F.</p>

**ELECTRICAL PARTS & THEIR FUNCTIONS**

# ELECTRICAL PARTS AND FUNCTIONS

## CORRECT CHANGE LAMP

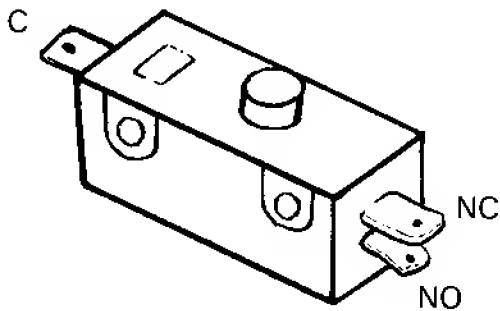


Correct Change Lamp

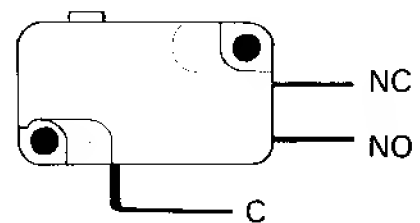
The correct change lamp is mounted in the coin insert casting and is retained by projections on the top and bottom.

The correct change lamp is controlled by the coin changer and is "OFF" when coins are in the tubes.

## SELECT SWITCH



OR



Select Switch

The select switch is located in the selector panel behind the push button and is secured with two (2) screws.

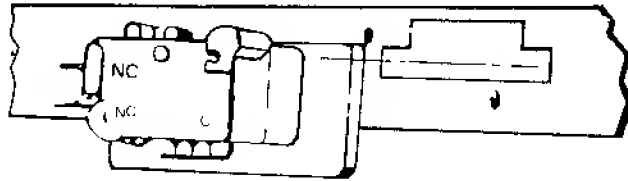
The N.O. contact of the Select Switch is in the sold out lamp and vend motor coil circuits. This N.O. contact closes and completes the sold out lamp circuit and the vend motor coil circuit.

The N.C. contact of the Select Switch is in the Select Panel Circuit.

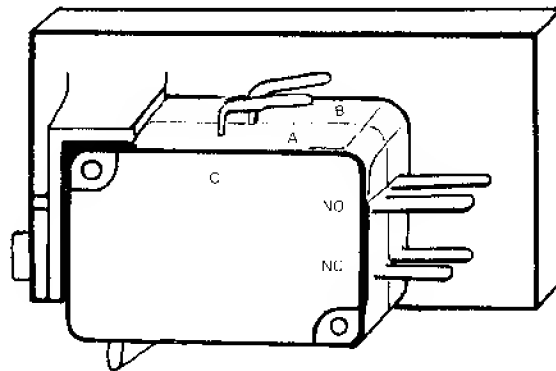
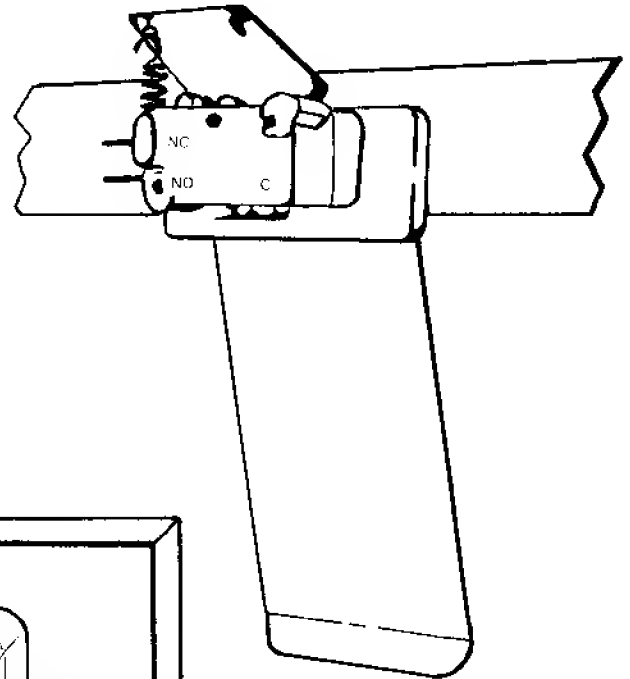
## **SOLD OUT SWITCHES** (2 in a cluster)

The Sold Out Switches are located on the front mechanism plate under the Vend Motor Cover.

The Sold Out Switches are the "snap in" type. To install, place the switch in position over the opening, push in and at the same time, slide to the right.



**SOLD OUT SWITCH PACK**



**Sold Out Switch Pack**

The sold out switch pack (one for each vending circuit) is located near the bottom of the column at the front and snaps into place.

### **(A) Front Sold Out Switch** (one for each column)

The N.C. contact of the front sold out switch is in the Vend Relay Coil Circuit and the Coin Changer Inhibit Circuit. This N.C. contact (kept closed by can or bottle) is in parallel with all the other N.C. contacts of the Front Sold Out Switches and when all are open, the coin changer will not accept coins.

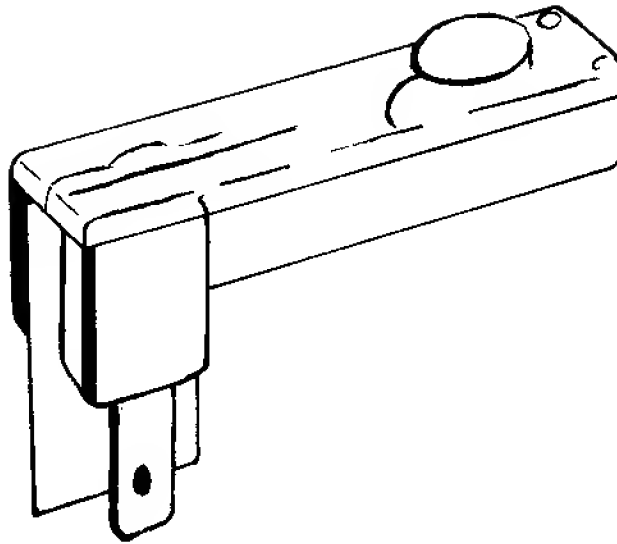
The N.O. contact of the front sold out switch has no function.

### **(B) Vend Sold Out Switch** (one for each vending circuit)

The N.C. Contact of the Vend Sold Out switch is in the Vend Motor Circuit. This N.C. contact (held closed by can or bottle) stays closed in the vend motor circuit so the Vend Motor Circuit can be completed.

The N.O. contact of the Vend Sold Out Switch is in the Sold Out Lamp circuit (kept open by a can or bottle). When not kept open by a can or bottle, the N.O. contact closes and completes the Sold Out Lamp circuit.

## SOLD OUT LAMPS



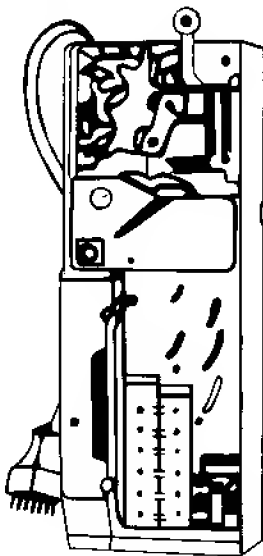
Sold Out Lamp

The Sold Out Lamp (one for each vending circuit) is secured to the back of the select button in the Selector Panel.

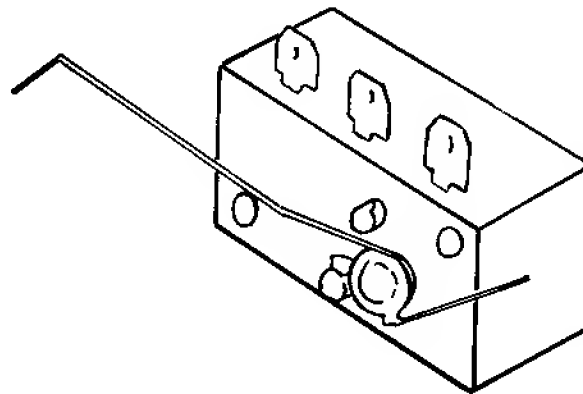
The Sold Out Lamp is turned on by the closing of the N.O. contacts of the Vend Sold Out Switch.

## COIN VEND SWITCH

(Coin Changer)



Coin Changer



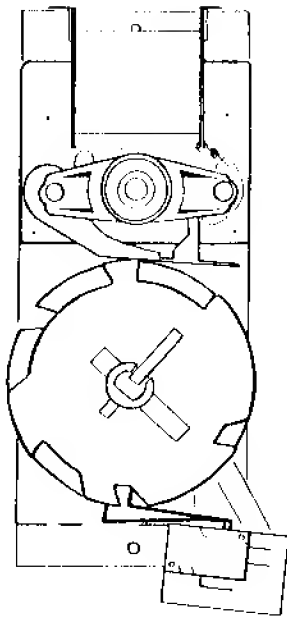
Coin Vend Switch  
(Used in mechanical coin mechs)

The Coin Vend Switch is located below the slug rejector and is fastened to the coin changer housing with two (2) screws and nuts.

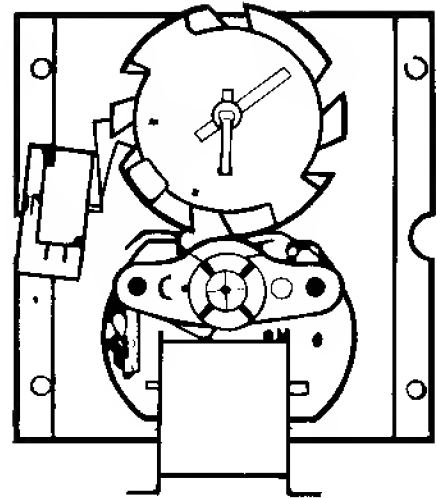
The N.O. contact of the Coin Vend Switch is in the vend relay coil and the coin changer magnet circuits. This N.O. contact closes and completes the vend relay coil circuits.

The N.C. contact of the Coin Vend Switch is in the Vend motor coil circuits. This N.C. contact closes in the vend motor coil circuits to set up these circuits so that a selection can be made.

## VEND MOTOR



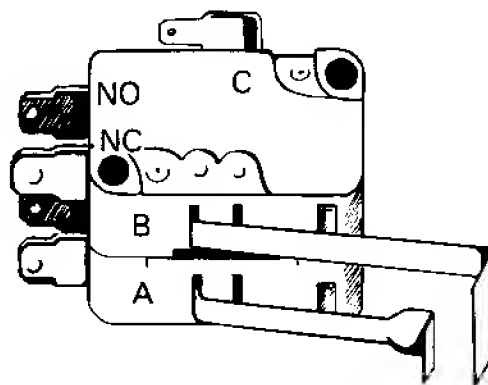
For Narrow Column



For Wide Column

The Vend Motor (one for each vending stack) is mounted on a bracket at the front of the vender. The Vend Motor is in the Vend Motor Coil Circuit. The Vend Motor runs when a N.O. select switch (pushed) closes and completes the Vend Motor Coil Circuit. The Vend Motor continues to run through the N.O. contact (closed by the Vend Motor Cam) of the Vend Motor Switch. The Vend Motor stops when the Vend Motor Switch arm drops off the high side of the Vend Motor Cam.

## VEND MOTOR SWITCH



A. Vend Motor Switch

The Vend Motor and the By-Pass Switches are together and do not come apart. The **Vend Motor Switch**, one (1) for each circuit, is located on the Vend Motor Assembly and secured by two (2) screws.

The N.O. contact of the Vend Motor Switch is in the Vend Motor Coil Circuit. This N.O. contact closes in the Vend Motor Coil Circuit to keep the Vend Motor running and at the same time lights the sold out light, until the arm of the Vend Motor Switch drops into the cam notch and the Vend Motor stops.

The N.C. contact of the Vend Motor Switch has no function.



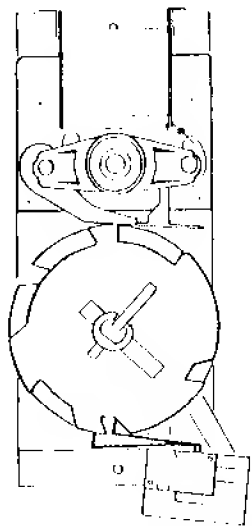
## B. BY-PASS SWITCH

The Vend Motor and the By-Pass Switches are together and do not come apart. The **By-Pass Switch**, one (1) for each circuit, is located on the Vend Motor Assembly secured by two (2) screws. This switch is a by-pass around the Vend Motor Switch to keep the Coin Changer Inhibit Circuit closed if the Vend Motor stops or is stopped when the arm of the Vend Motor Switch is top side of the vending cam, i.e., all other vending circuits are operative.

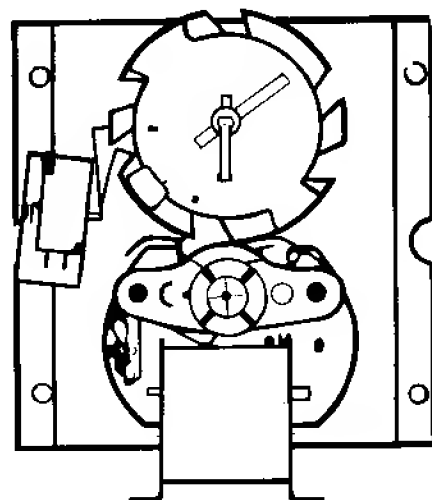
The N.O. contact of the By-Pass Switch, (held closed by the vending cam), is in the Coin Changer Inhibit Circuit. Shortly after the beginning of the vending cycle, the arm of the switch (worked by the vending cam) drops into the cam notch and this N.O. contact opens in the Coin Changer Circuit. When the arm of the switch reaches the top side of the cam, this N.O. contact closes in the Coin Changer Circuit and remains closed at the end of the vending cycle.

The N.C. contact of the By-Pass Switch is in the Coin Changer Circuit. This N.C. contact opens in the Coin Changer Circuit. The N.C. of the By-Pass Switch is also in the Vend Motor Coil Circuit. The N.C. contact closes in the vend motor coil circuit to keep vend motor running until the N.O. contact of vend motor switch closes to keep the vend motor running.

## HOW THE VEND/BY-PASS SWITCHES WORK



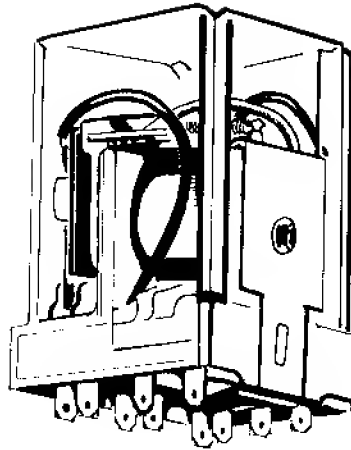
For Narrow Column  
Fig. 1



For Wide Column  
Fig. 2

1. See the Vend Motor and Vend Motor switches in the stand-by position Figure 1 and Figure 2. The Arm of the Vend Motor Switch A is in the cam notch - Figure 2. The Arm of the By-Pass Switch B is on top of the cam - Figure 2.
2.
  - a. Set up a credit.
  - b. Make a selection.  
(Pushing a select switch causes the vend motor to run and the arm of the by-pass switch drops into the cam notch and breaks the circuit to the vend relay coil [cancels credit].)
  - c. The Vend Motor continues to run through the notch.
  - d. The arm of the Vend Motor switch reaches the top side of the cam causing the vend motor to continue to run.
  - e. A fraction of a second later the by-pass switch arm reaches the top side of the cam and forms a by-pass around the vend motor switch. If a jam occurs, all other selections will work.
  - f. The Vend Motor continues to run to the stand-by position.

## VEND RELAY



### **VEND RELAY SWITCH NO. 1 N.C.** (the N.O. contact is not used)

The N.C. contact of Vend Relay Switch No. 1 is the Coin Changer Inhibit Circuit. When this N.C. contact opens the Coin Changer is inhibited.

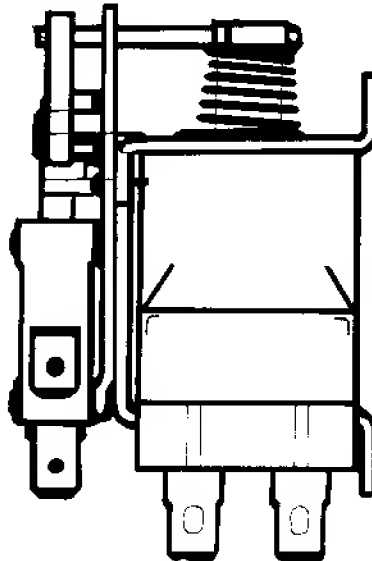
### **VEND RELAY SWITCH NO. 2 N.O.** (The N.C. contact is not used)

The N.O. contact of Vend Relay Switch No. 2 is in each of the Vend Motor Coil Circuits. This N.O. contact closes in the Vend Motor Coil Circuits to set up these circuits so that a selection can be made.

### **VEND RELAY SWITCH NO. 3 N.O.** (The N.C. contact is not used)

The N.O. contact of Vend Relay Switch No. 3 is in the Vend Relay Coil Circuit. This N.O. contact closes and keeps the Vend Relay Coil Circuit completed.

### **SEQUENCE RELAY** (Not on all Venders)



The sequence relay is located on a bracket, adjacent to the vend relay (credit relay) on the main door and secured with two (2) screws.

When a credit is set up by the Coin Changer and the vend relay is energized, the N.O. vend relay switch #2 closes and completes the sequence relay coil circuit.

The sequence relay coil circuit is broken when any N.C. select switch opens in the sequence relay coil circuit.

## VEND MOTOR WIDE COLUMN

Mounted on the vender with the Vend/By-Pass switches on the left side (See Fig. 3). Linkage and drive arm assembly is used to connect the vend motor to the oscillator. (See Fig. 4)

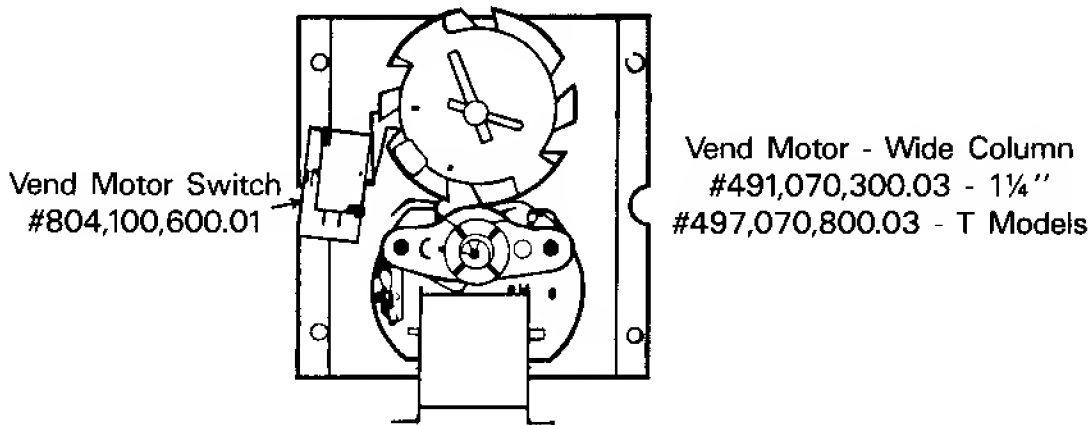


Fig. 3

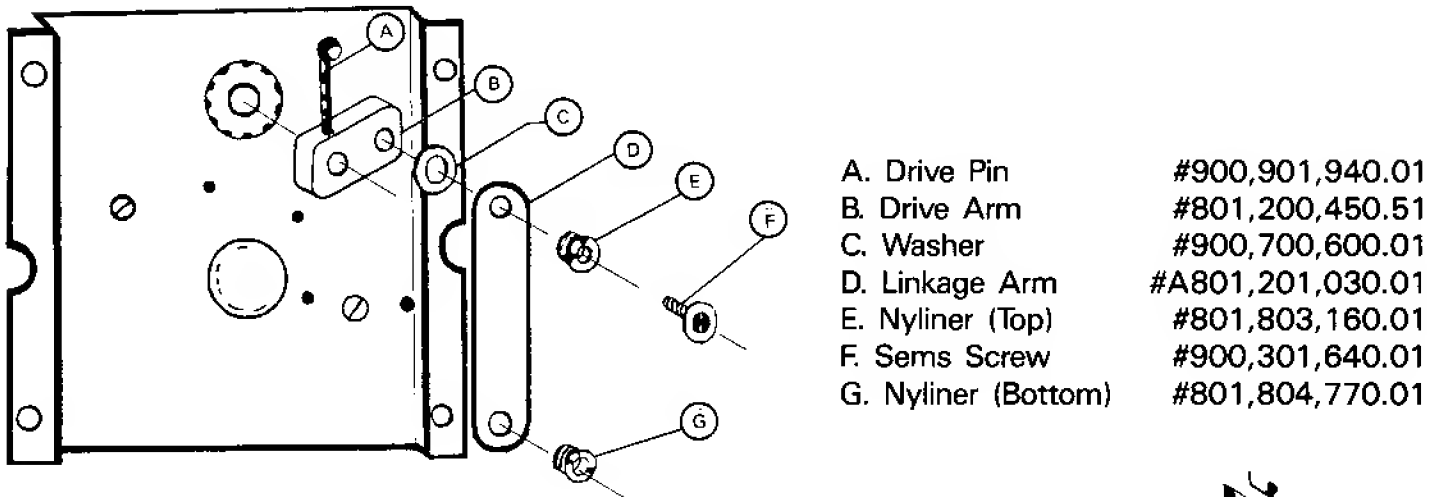
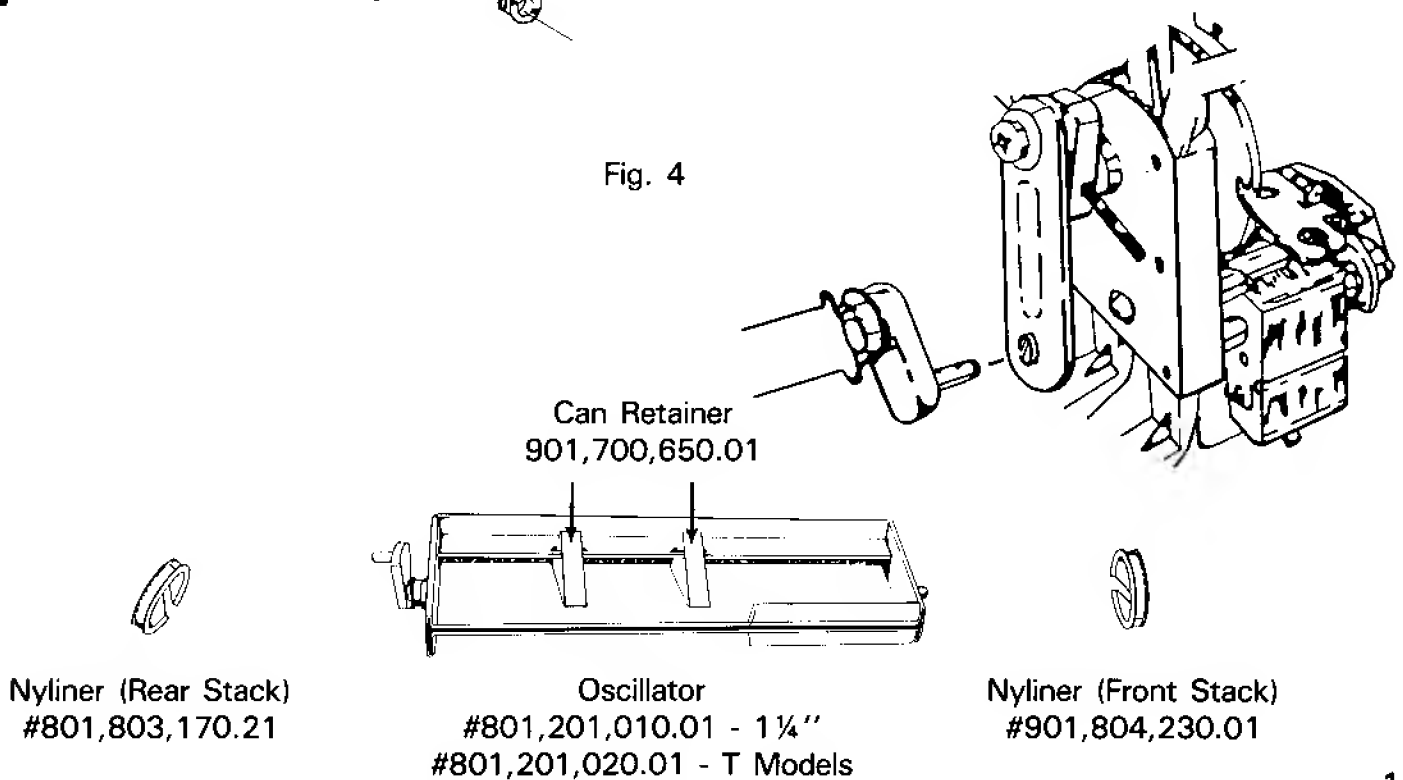
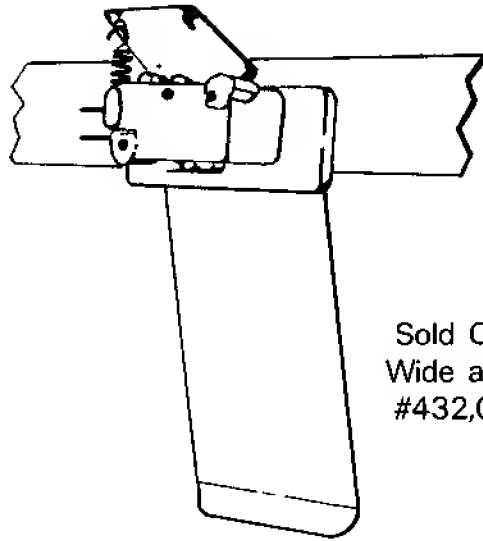


Fig. 4



Sold Out Spring  
#901,700,740.01

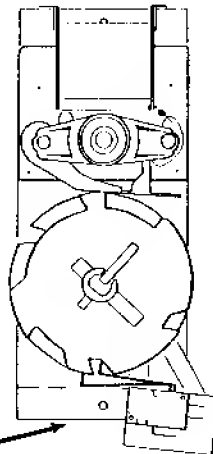
Sold Out Switch Assy. Snap In  
#804,100,610.01  
(Insulator and Switch are  
one (1) piece)



Sold Out Paddle  
Wide and Narrow  
#432,070,190.13

## VEND MOTOR NARROW COLUMN

Mounted on the vender with the Vend/By-Pass switches on the underside (See Fig. 1). Shaft of the vend motor slides into a slot in the vend rotor (See Fig. 2).



Vend Motor - Narrow Column  
#491,070,400.03 - 1 1/4"  
#497,070,900.03 - T Models

Vend Motor Switch  
#804,100,600.01

Fig. 1

(No Nyliner Required)

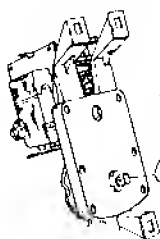


Fig. 2

Vend Rotor  
#801,201,211.61 - 1 1/4"  
#801,201,230.01 - 489/588  
#801,201,220.01 - T Model

Nyliner (Rear Stack)  
#801,803,170.21

# **PRODUCT SHIMMING**

# **PRODUCT SHIMMING**

Refer to the appropriate service bulletin for proper set-up and vending procedures.

**SERVICE BULLETIN 377 -** For 5, 6, 8, and 10 column Adaptable and Dual Adaptable 1¼" Deeper Shimless Stack venders. Serial #'s 0001-3098AN and up. Also, identified with a large decal on motor cover or sold out bar cover reading; **SHIMLESS STACK**

**SERVICE BULLETIN 247 -** For 5, 6, 8, and 10 column Adaptable and Dual Adaptable 1¼" Deeper pre-series 90 venders. Serial #'s 001-2569CG to 0001-3098AN.

**SERVICE BULLETIN 282 -** For 8 column "T" models (501's and 600's). This includes both pre-series 90 and Series 90 T Models. Serial #'s 0001-2775 DI and up.

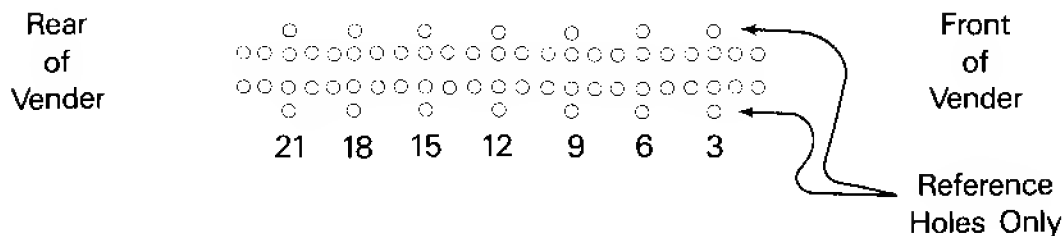
**For shimming of venders or products not listed in the above Service Bulletins, call the Dixie-Narco Service Department or contact your Dixie-Narco Representative.**

# PRODUCT SHIMMING

Refer to proper Service Bulletin for proper set up and vending.

**This page is for reference only.**

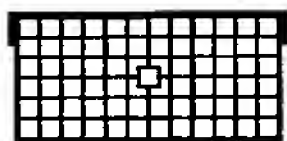
Rear spacer adjustment holes located in the sidewalls of the stacks



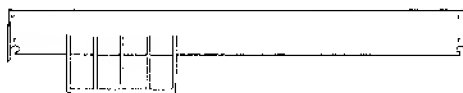
The shims and rods shown here are for reference only, i.e., to identify these parts. Refer to corresponding shimming bulletin for shims and rods required per column, for vend cam adjustment on vend motors for both wide and narrow columns for different product vending.

## SHIM & ROD EXAMPLES:

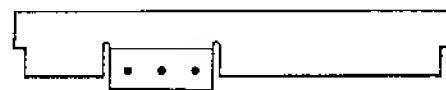
From **SERVICE BULLETIN 247** (1¼" Deeper Pre-series 90 Pre-shimless stack)



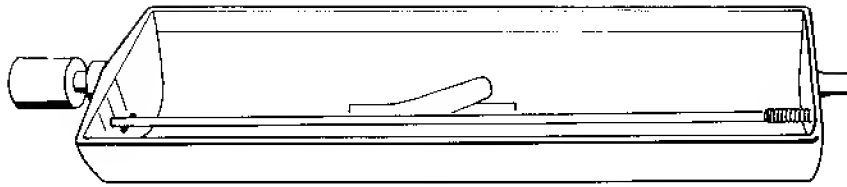
12 oz. can Flat Black Shim  
Wide Columns  
#801,804,960.01



12 oz. can Shim  
Narrow Columns  
#801,804,950.21



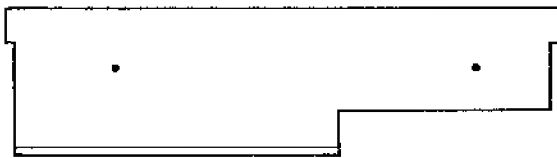
10 oz. PLB Shim  
#267,010,230.01



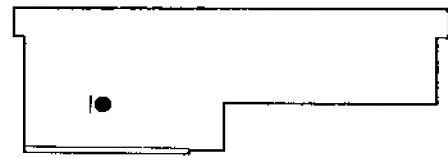
Rotor  
#801, 201, 060.01  
Rod & Spring Assembly  
#267,012,300.03

From: **SERVICE BULLETIN 377** (1¼" Deeper Shimless Stack)

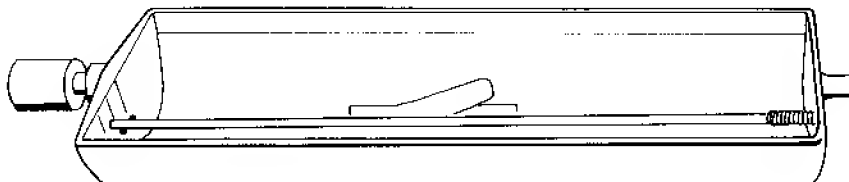
NOTE: No shims are needed to vend 12 oz. cans or 10 oz. PLB bottles.



10 oz. can shim (rimless)  
6 & 8 column venders  
#463,010,010.03



10 oz. can shim (rimless)  
10 column venders  
#350,010,010.03



Rotor  
#801, 201, 210.01  
Rod & Spring Assembly  
#267,012,300.03



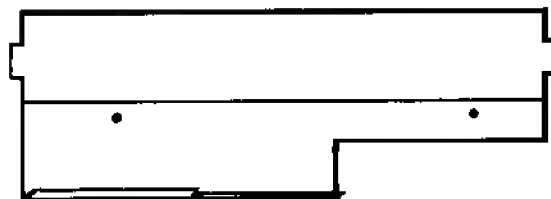
From **SERVICE BULLETIN 282** (501T and 600T - triple depth can venders)



Left hand ribbed shim for 12 oz. cans (shown  
above)

#801,804,900.01

Right hand ribbed shim #801,804,890.01 (Not  
shown)

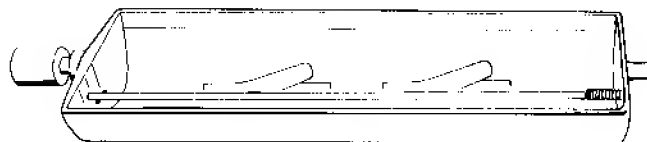


Can stop shim

497,070,130.33



Bubble shim for 16 oz. PLB  
#361,010,080.43



Rotor

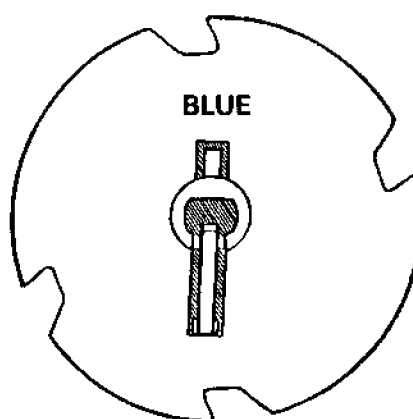
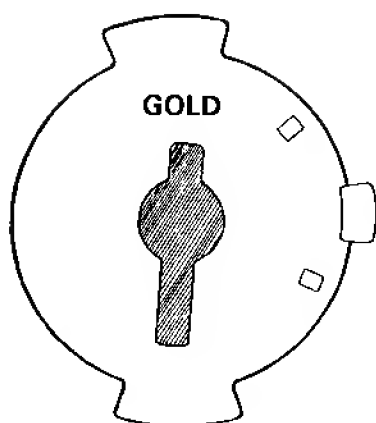
#801, 201, 220.01

Rod and spring assembly

#361,010,100.03

## **AJUSTMENTS: CAMS/REAR SPACERS**

# CAMS FOR VEND MOTORS

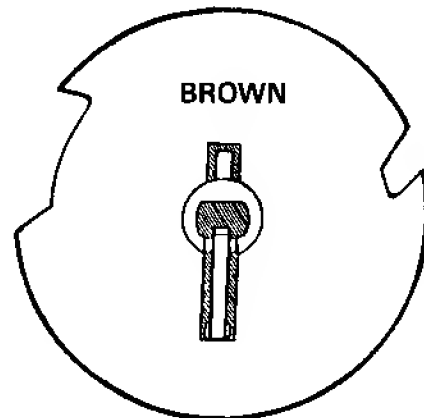
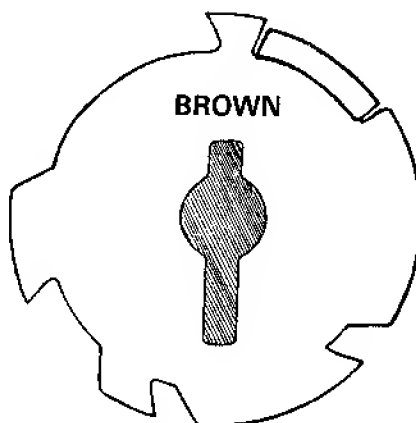
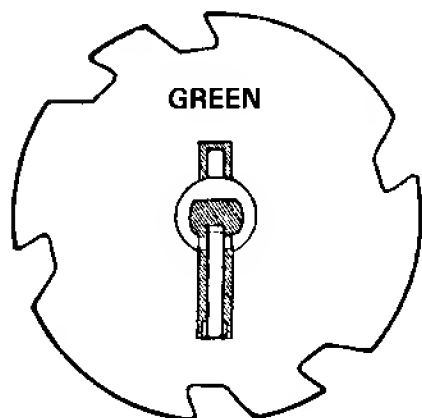


## 1. Adjustable Cam For:

- DNCB 1 1/4" deeper wide column.
- DNCB T Models and DNCB 489 and 588 single, double or triple depth wide column.
- Color of Cam is Gold.
- Part #801,806,400.11

## 2. Vending Cam For:

- DNCB 1 1/4" deeper single and double depth wide column.
- DNCB T-Models and DNCB 489 and 588 single depth wide column.
- Color of Cam is Blue.
- Part #801,806,390.11.



## 3. Vending Cam For:

- DNCB T Models and DNCB 489 and 588 double or triple depth wide column.
- Color of Cam is Green.
- Part #801,806,410.01.

## 4. Adjustable Cam For:

- DNCB 1 1/4" deeper narrow column.
- DNCB T Models and DNCB 489 and 588 single, double or triple depth narrow column.
- Color of Cam is Brown.
- Part #801,806,610.21.

## 5. Vending Cam For:

- DNCB 1 1/4" deeper narrow column.
- DNCB T Models and DNCB 489 and 588 single, double or triple depth narrow column.
- Color of Cam is Brown.
- Part #801,806,180.21.

# CAM INSTALLATION AND REMOVAL

## TO INSTALL A VENDING CAM:

1. Select the vending cam required. (See page 20).
2. Locate the hub at the center of the cam (See Fig. 6).
3. With the hub facing you, slowly slide the cam onto the front shaft of the vend motor while depressing the lock tab. (See fig.6).

NOTE: Reference below for timing of the motors.

4. A distinct click will be heard, when the tab has locked into the locator hole of motor shaft.

**CAUTION:** Depress the switch arms when installing the cam to prevent possible damage to the switch arms.

## TO INSTALL AN ADJUSTABLE CAM:

1. Select the adjustable cam required. (See page 20).
2. Locate the lift tab on the outer edge of the cam. (See Fig 5).
3. With the lift tab facing you, align the slot of the adjustable cam with the locking tab of the vending cam.
4. Place the adjustable cam onto the vending cam.

**CAUTION:** Depress the switch arms when installing the cam to prevent possible damage to the switch arms.

5. Lift the lock tab of the vending cam, at the same time lift the lift tab of the adjustable cam and rotate the adjustable cam clockwise to the desired setting.

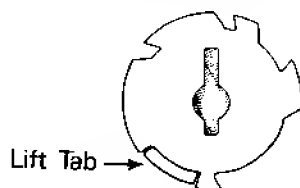


Fig. 5  
Adjustable CAM

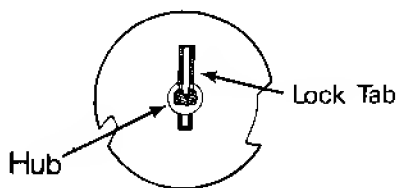


Fig. 6  
Vending CAM

## TO REMOVE AN ADJUSTABLE CAM:

1. Lift the lift tab and rotate the adjustable cam clockwise until the vending cam lock tab is aligned with the slot of the adjustable cam.
2. Remove the adjustable cam from the shaft of the motor.

## TO REMOVE THE VENDING CAM:

1. Depress (push in) the lock tab firmly to disengage it from the motor shaft.
2. At the same time pull the vending cam towards you until it is removed from the motor shaft.

# TIMING

## TO SET THE TIMING OF A NARROW COLUMN VEND MOTOR:

1. Make sure the hole through the rear shaft is in a horizontal plane. (If a pin were inserted in the hole, the pin would be horizontal.) See Fig 8, pg. 22.
2. The vend rotor must be in the loading position when the motor shaft is inserted into the end of the rotor. See Fig. 8, pg. 22.
3. Insert the motor shaft into the rotor and secure the motor.
4. Install the vending cam onto the front shaft of the motor making sure the lock tab is at the 9 o'clock position. See Fig 7, pg. 22.
5. Install the adjustable cam per the instructions above.

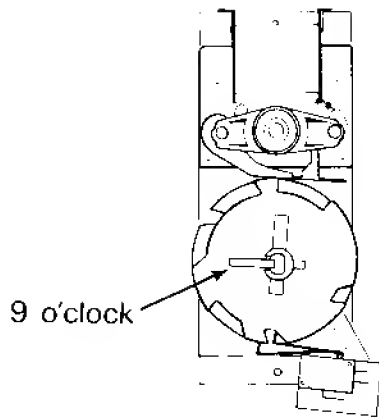


Fig. 7.

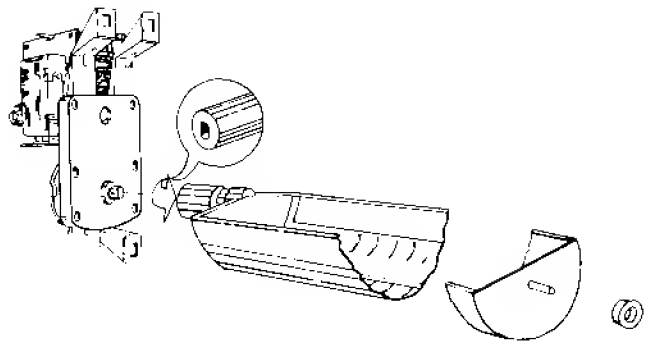


Fig. 8

### TO SET THE TIMING OF A WIDE COLUMN VEND MOTOR.

1. Make sure the hole through the rear shaft is in a horizontal plane. (If a pin were inserted in the hole, the pin would be horizontal). See Fig. 10.
2. Slide the Drive Arm (with linkage attached) onto the rear shaft as shown. See Fig. 10.
3. Secure by installing the groove pin.
4. With the oscillator in position, align the hole in the linkage arm with the pin of the oscillator.
5. Slide the linkage onto the pin.
6. Install the vending cam onto the front shaft of the motor making sure that the lock tab is at 6 o'clock as shown. See Fig. 11.

**NOTE: When the screw holding the linkage arm to the drive arm is at a 12 o'clock position (See Fig. 10), the lock tab will be at the 6 o'clock position (See Fig. 11).**

7. Install the adjustable cam per the instructions on page 21.

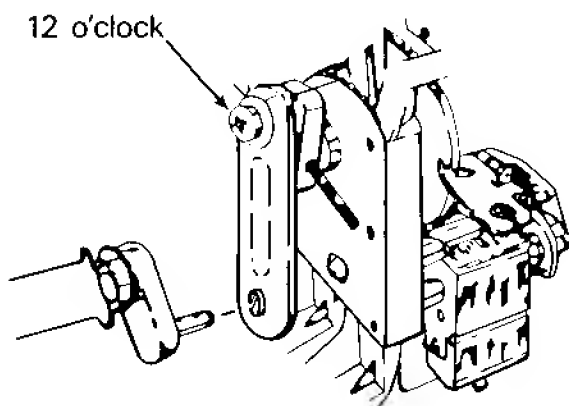


Fig. 10

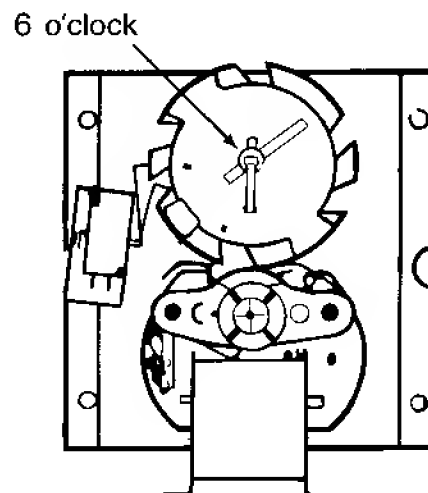


Fig. 11

## REAR SPACER

The rear spacer, one for each column, is located vertically at the rear of the column. The latch fingers, adjustable by hand, slide into the holes in the column wall for cans and other package settings.

See Fig. 13, the latch fingers are in the open position with the lock tabs disengaged.

See Fig. 14, the latch fingers are in the closed position with the lock tabs engaged. Make sure the tabs are in a locked position as shown, before loading the vender.

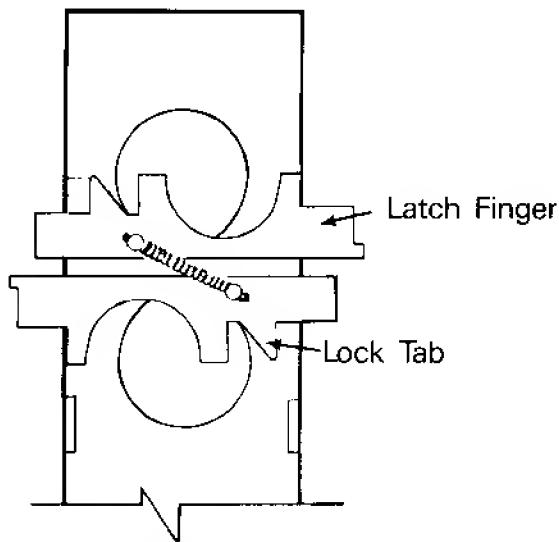


Fig. 13  
Rear Spacer

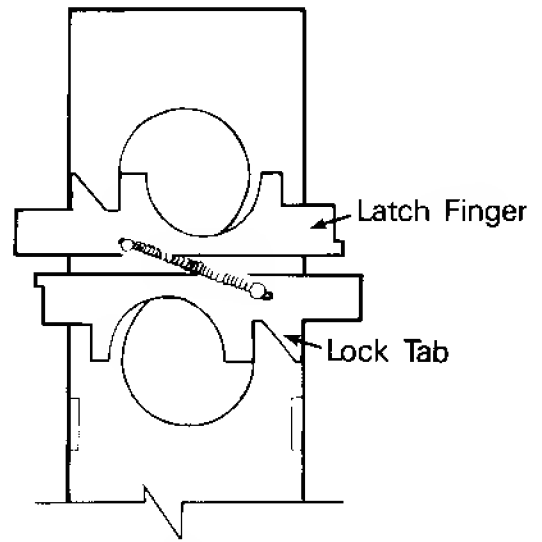


Fig. 14  
Rear Spacer

## **VEND CYCLE POWER FLOW**

# VEND CYCLE

## HOW THE VENDING MECHANISM WORKS

Refer to across the line wiring diagrams beginning on page 27, 28, 29

WHAT DOES IT	WHAT HAPPENS
* 1. Insert a coin	1. Coin travels into the coin mechanism.
* 2. The coin	2. Pushes the coin vend switch arm down and;
* 3. The N.O. contact of the coin vend switch	3. Closes and completes the vend relay coil circuit.
4. The Vend Relay Coil is energized	4. Closes the N.O. contact of the Vend Relay Switch #3 in the vend relay coil circuit, holding the vend relay closed.  Opens the N.C. contact of the vend relay switch #1 in the Coin Changer Inhibit circuit.  Closes the N.O. contact of the vend relay switch #2 in the vend motor coil circuit.
* 5. A spring (in the coin vend switch)	5. Pulls the coin vend switch arm back up and;
* 6. The N.C. contact of the coin vend switch	6. Energizes the select panel (and completes the sequence relay coil circuit, if there is a sequence relay circuit).
7. The customer pushes a select button	7. While the select button is depressed
8. The N.O. contact in the select switch	8. Closes and completes the circuit to the sold out lamp and the vend motor coil.
9. The vend motor	9. Starts to run and at the same time,
10. The N.C. contact in the select switch	10. Opens in the select panel circuit, and a short time later
11. The arm of the by-pass switch	11. Drops into the notch of the cam
12. The N.O. contact of the by-pass switch	12. Opens in the select panel circuit

\*Steps 1, 2, 3, 5, 6 represent the use of a mechanical coin changer.



WHAT DOES IT	WHAT HAPPENS
<p>13. The N.O. contact of the vend relay switch #3</p> <p>14. The N.O. contact of the vend relay switch #2</p> <p>15. The N.C. contact of the vend relay switch #1</p> <p>16. The N.C. contact of the by-pass switch</p> <p>17. The vend motor</p> <p>18. The vending cam</p> <p>19. The N.C. contact of the vend motor switch opens</p> <p>20. The N.O. contact of the vend motor switch closes</p> <p>21. A short time later the arm of the by pass switch rides to the high side of the cam</p> <p>22. The N.O. contact of the by-pass switch closes</p> <p>23. The vending cam</p> <p>24. The N.O. contact of the vend motor switch opens</p> <p>25. The N.C. contact of the vend motor switch closes</p>	<p>13. Opens in the vend relay coil circuit</p> <p>14. Opens in the vend motor coil circuit and opens and breaks the select panel circuit</p> <p>15. Closes in the coin changer circuit and</p> <p>16. Closes and completes the circuit to the vend motor coil.</p> <p>17. Continues to run</p> <p>18. Works the arm of the vend motor switch and the switch arm rises to the high side of the cam</p> <p>19. And</p> <p>20. The sold out lamp turns on and</p> <p>The vend motor circuit receives power to keep the motor running.</p> <p>21. and</p> <p>22. Enabeling the coin changer</p> <p>23. Continues to work the arm of the vend motor switch and the switch arm drops into the notch of the cam</p> <p>24. Breaking the sold out lamp and vend motor coil circuits, the motor stops and the oscillator or rotor stops</p> <p>25. We are back to standby-by in the vender.</p>

## HOW THE VENDING MECHANISM WORKS

\*Refer to across the line wiring diagrams beginning on page 27.

Study the written vending cycle on pages 24 and 25 in connection with the across the line wiring diagram. The Across the Line Wiring Diagram can serve as an excellent "trouble shooting chart."

### EXAMPLE:

The Vender accepts coin.

The Vend relay is energized but immediately "pops" out.

### DO THIS:

Look at the Across the Line Wiring Diagrams on pages 27, 28 and 29 and locate:

1. the coin vend switch
2. the vend relay
3. the vend relay switch #1

### OBSERVATIONS:

1. The Vend relay coil is the affected circuit.
2. The N.O. coin vend switch is in the vend relay coil circuit.
3. The N.O. vend relay switch #3 is also in the vend relay coil circuit.
4. The N.O. vend relay switch #3 is the "holding switch" for this circuit.

### CONCLUSIONS:

1. N.O. vend relay switch #3 did not "hold" or keep the circuit closed.
2. N.C. vend relay switch #1 is open.

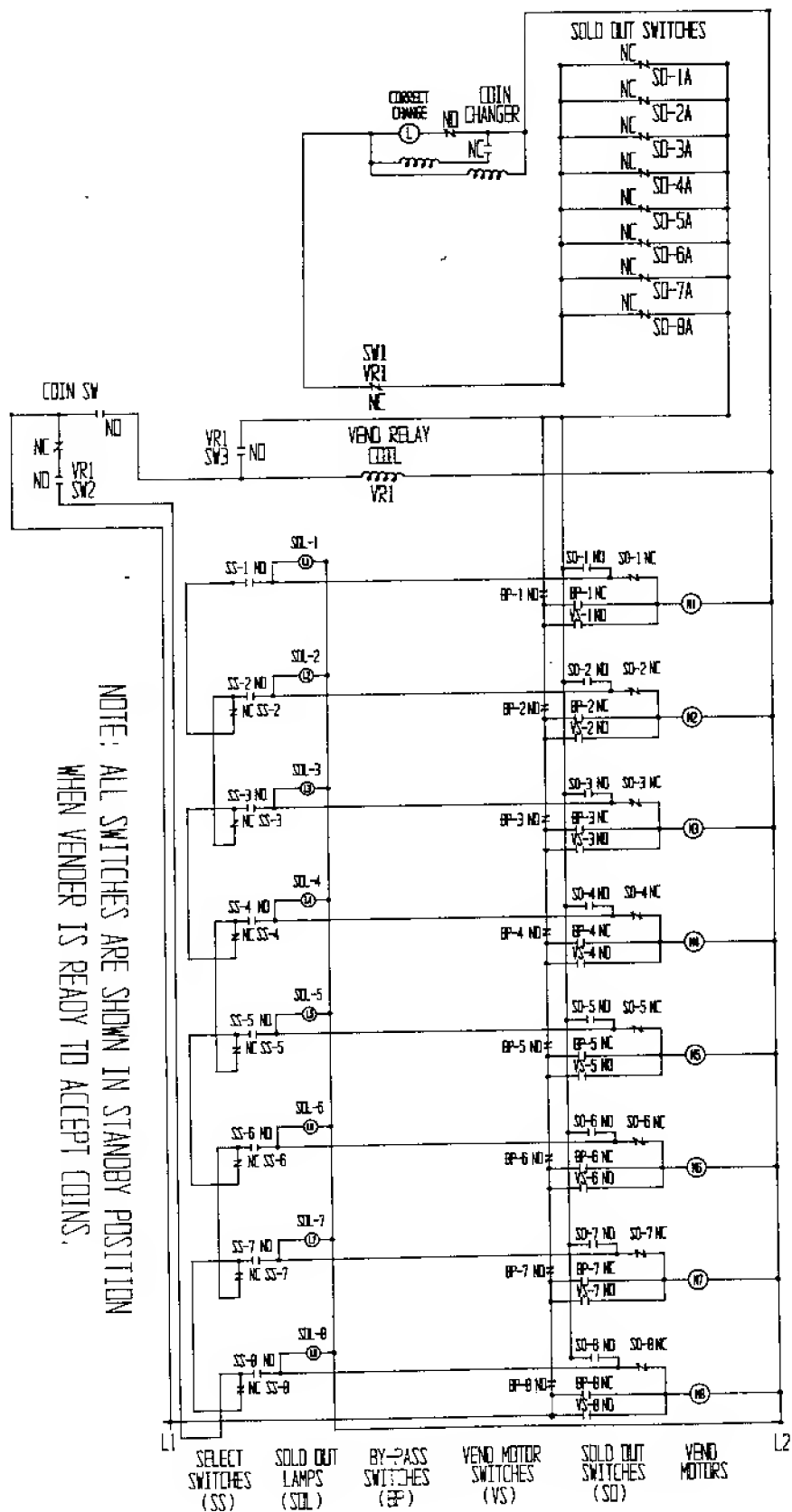
### CHECK:

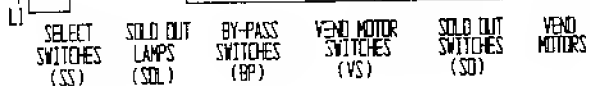
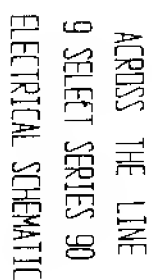
1. The gap between the contacts (too far apart). Replace the relay.
2. Dirt between the contacts. Replace the relay.
3. A broken wire.
4. The power flow is broken which feeds the common of the vend relay switch #3.

# **ELECTRICAL SCHEMATICS**

ACROSS THE LINE  
8 SELECT SERIES 90  
ELECTRICAL SCHEMATIC

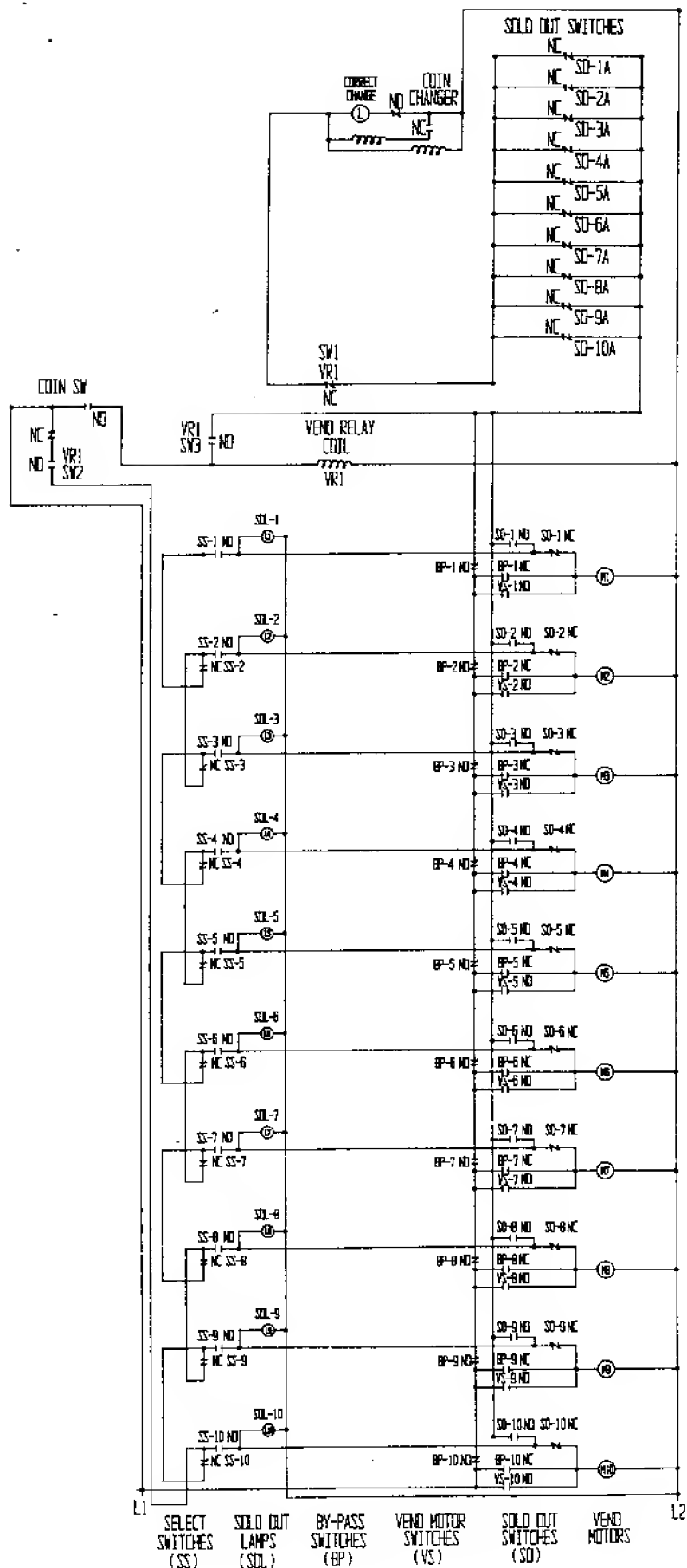
NOTE: ALL SWITCHES ARE SHOWN IN STANDBY POSITION  
WHEN VENDER IS READY TO ACCEPT COINS.





NOTE: ALL SWITCHES ARE SHOWN IN STANDBY POSITION  
WHEN VENDER IS READY TO ACCEPT COINS.

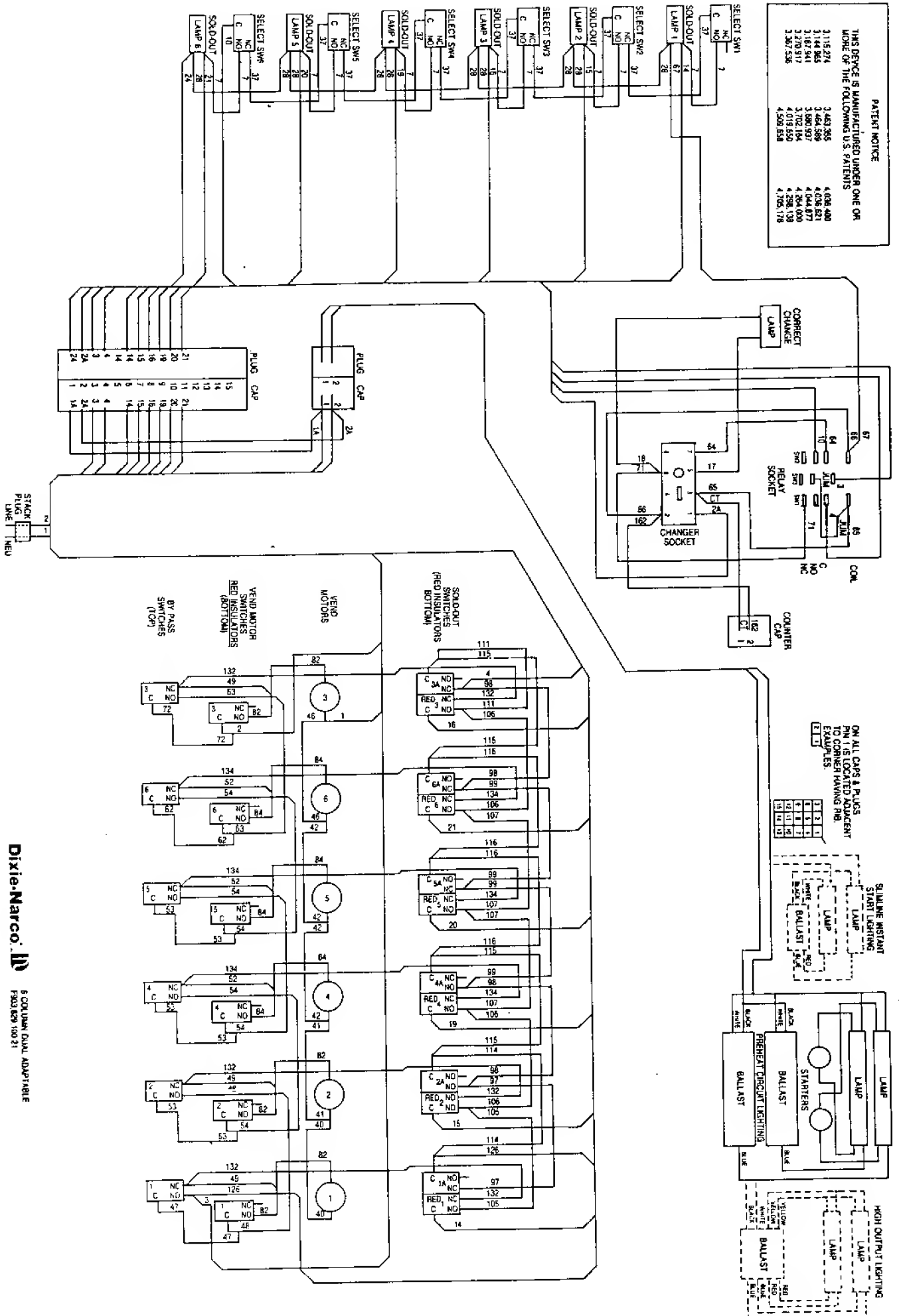
ACROSS THE LINE  
10 SELECT SERIES 90  
ELECTRICAL SCHEMATIC



PATENT NOTICE

THIS DEVICE IS MANUFACTURED UNDER ONE OR MORE OF THE FOLLOWING U.S. PATENTS

3,463,365	4,036,400
3,115,274	4,036,821
3,144,965	4,044,877
3,187,941	4,064,000
3,270,917	4,064,158
3,367,536	4,070,176
4,070,850	



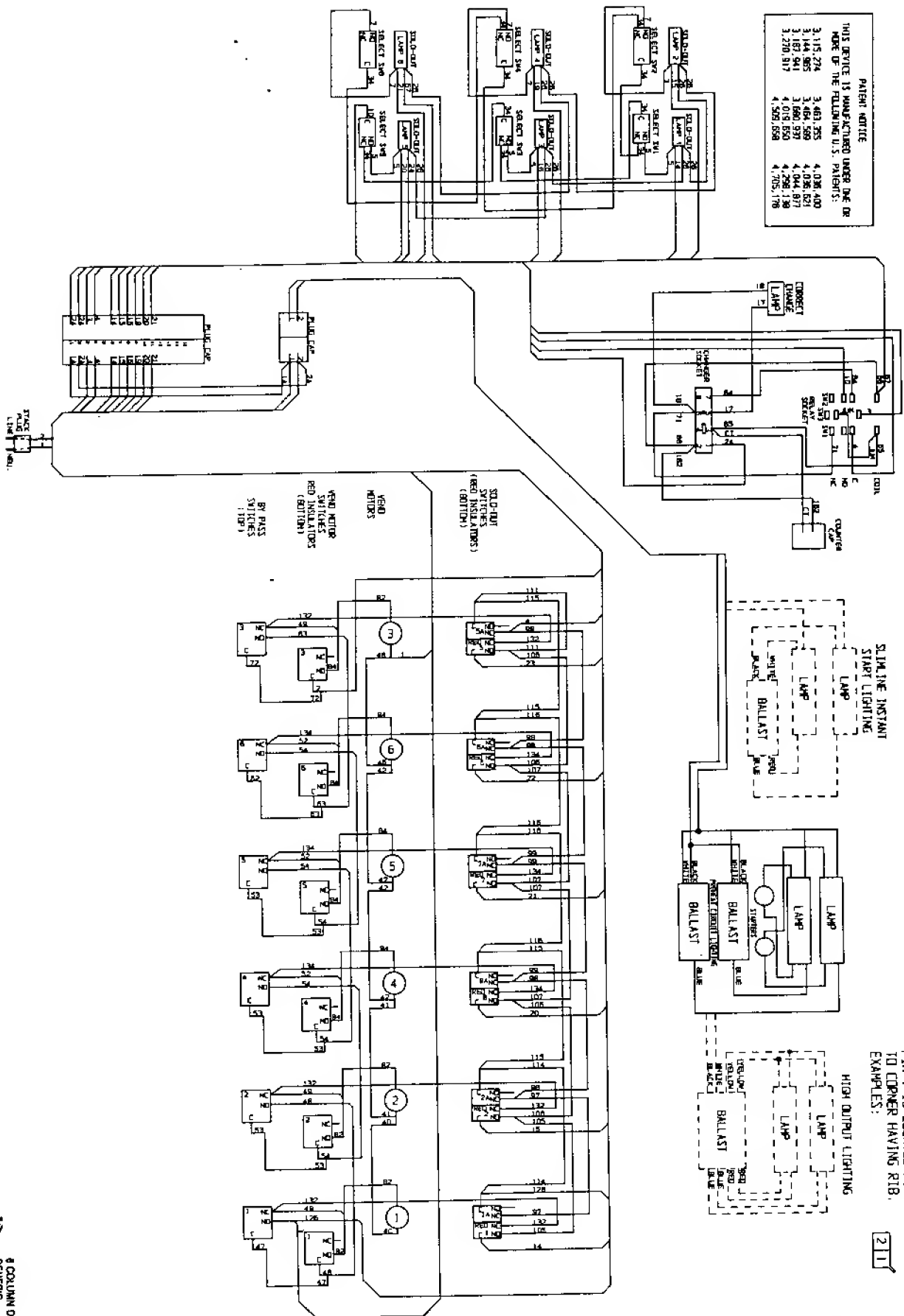
Dixie-Marco, Inc.

6 COLUMN DATA ADAPTABLE  
F303 829 100 21

PATENT NOTICE

THIS DEVICE IS MANUFACTURED UNDER ONE OR MORE OF THE FOLLOWING U.S. PATENTS:

3,115,274	3,483,355	4,036,400
3,144,985	3,484,589	4,036,521
3,187,941	3,680,937	4,064,817
3,270,917	4,018,850	4,299,138
	4,578,658	4,705,176



ON ALL CAPS & PLUGS  
PIN 1 IS LOCATED ADJACENT  
TO CORNER HAVING RIB.  
EXAMPLES:

21

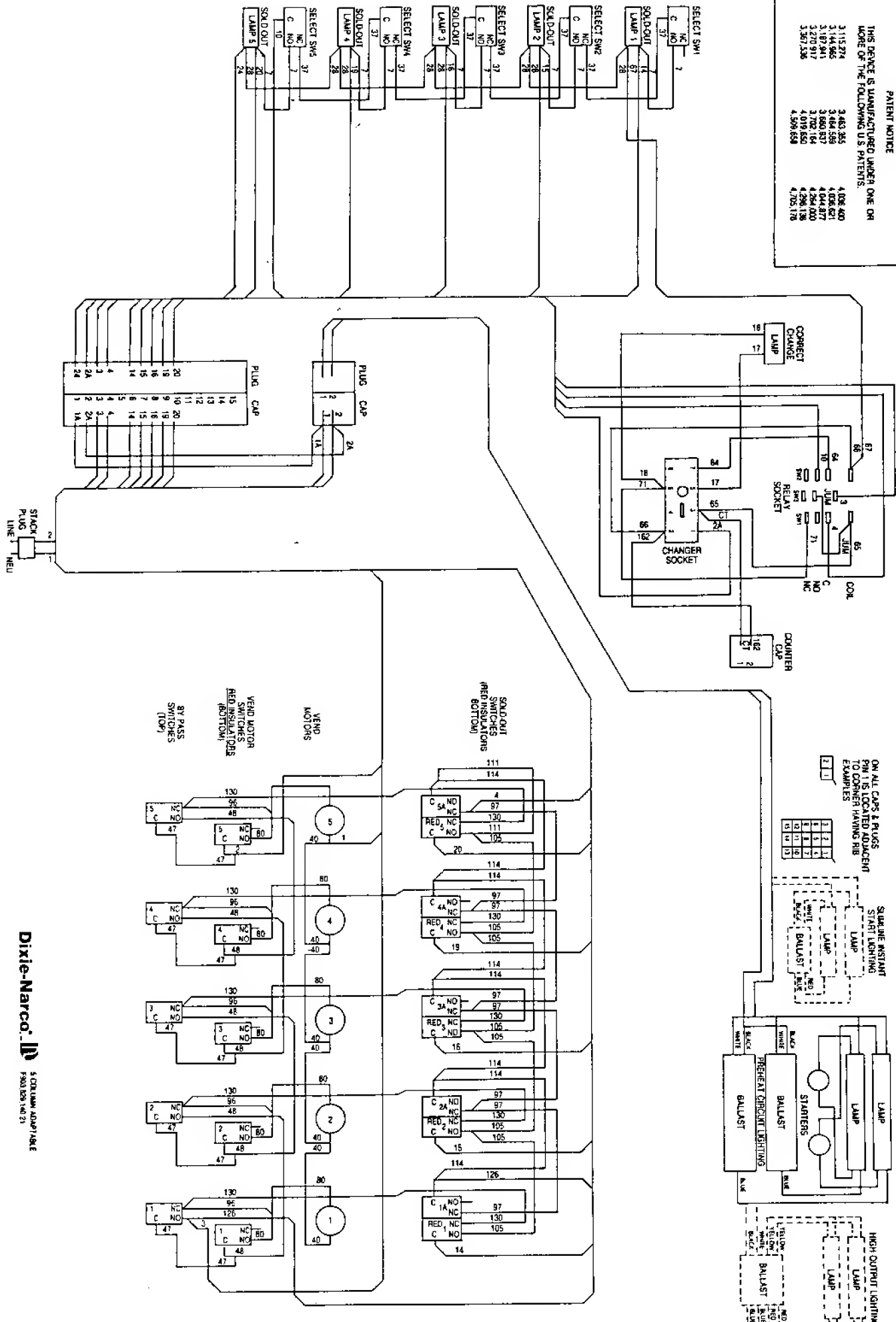
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6	5	4
9	8	7
12	11	10
15	14	13



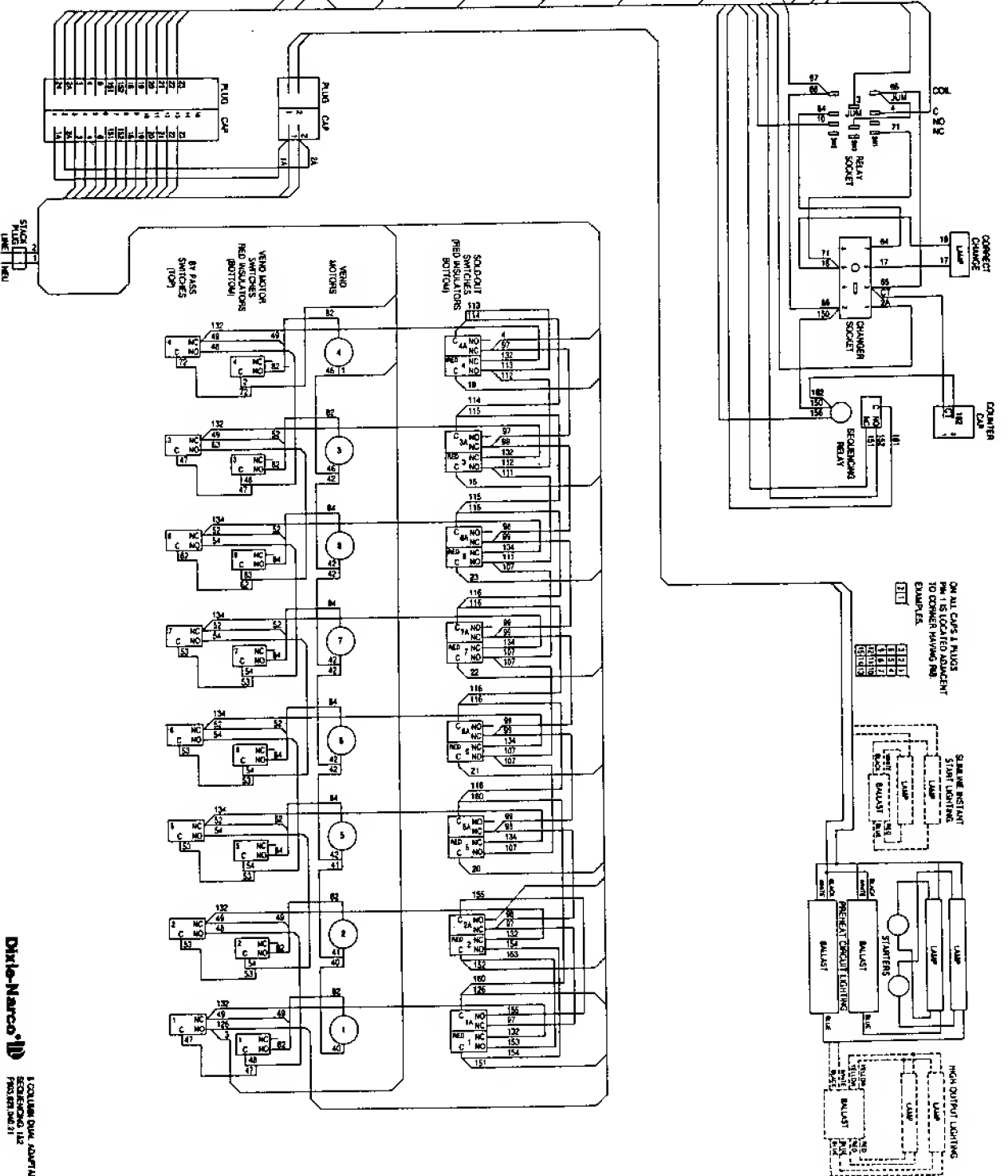
PATENT NOTICE

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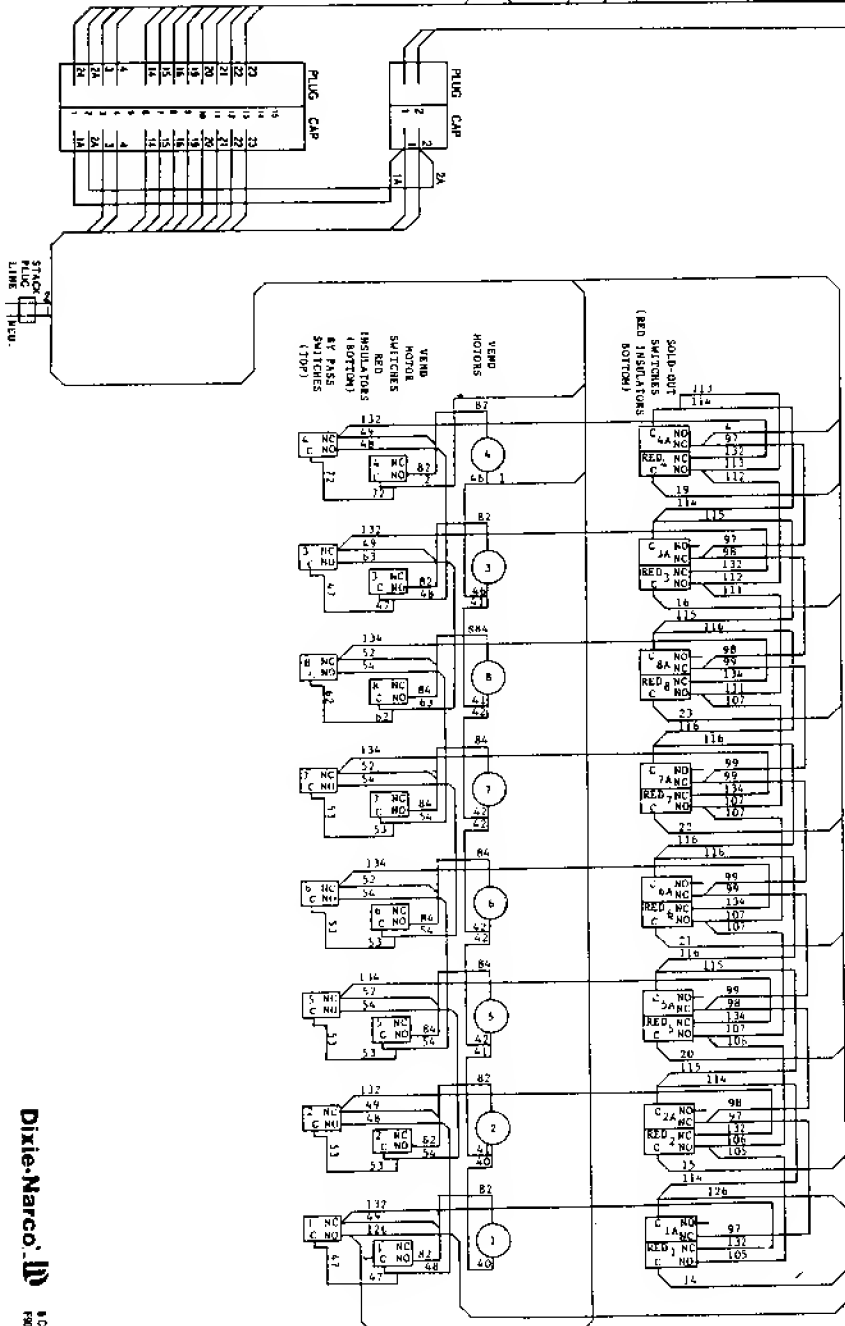
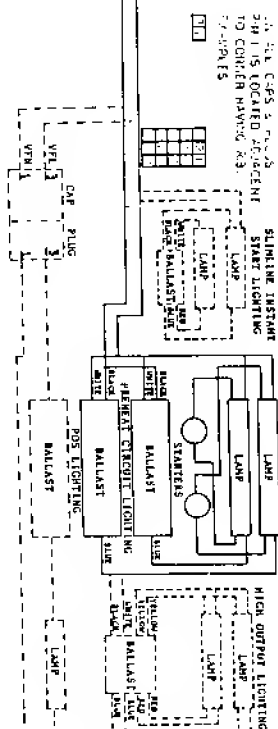
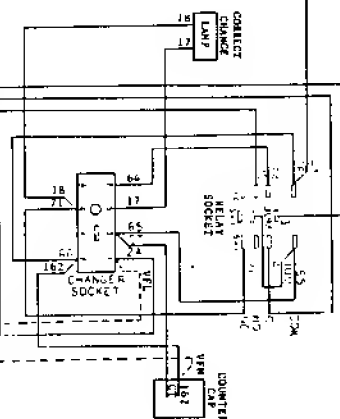
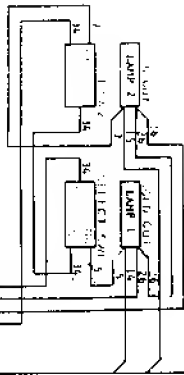
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3,144,565	3,464,589	4,008,621
3,187,941	3,660,837	4,044,877
3,270,917	3,702,164	4,264,000
3,357,536	4,019,650	4,296,138
	4,506,604	4,705,176



PATENT NOTICE	
THE SERVICE OF MANUFACTURED UNDER ONE OR MORE OF THE	
POLYCOMBS U.S. PATENTS	
3,119,374	3,463,355
3,164,965	4,038,420
3,187,841	3,444,589
3,276,817	3,860,437
3,363,536	3,702,164
	4,018,186
	4,298,336
	4,509,644
	4,702,176



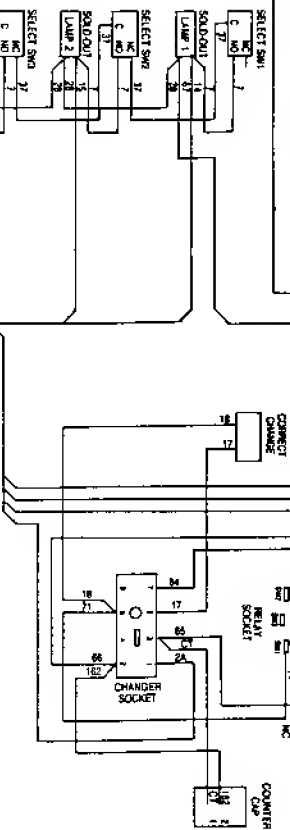
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3 1144 565	3 464 398	4 038 621
3 1187 941	3 660 437	4 044 817
3 210 817	3 702 184	4 294 000
3 367 536	4 018 650	4 294 136
	4 509 654	4 705 176



PATENT NOTICE

THIS DEVICE IS KNOWN AND CLAIMED UNDER ONE OR MORE OF THE FOLLOWING U.S. PATENTS:

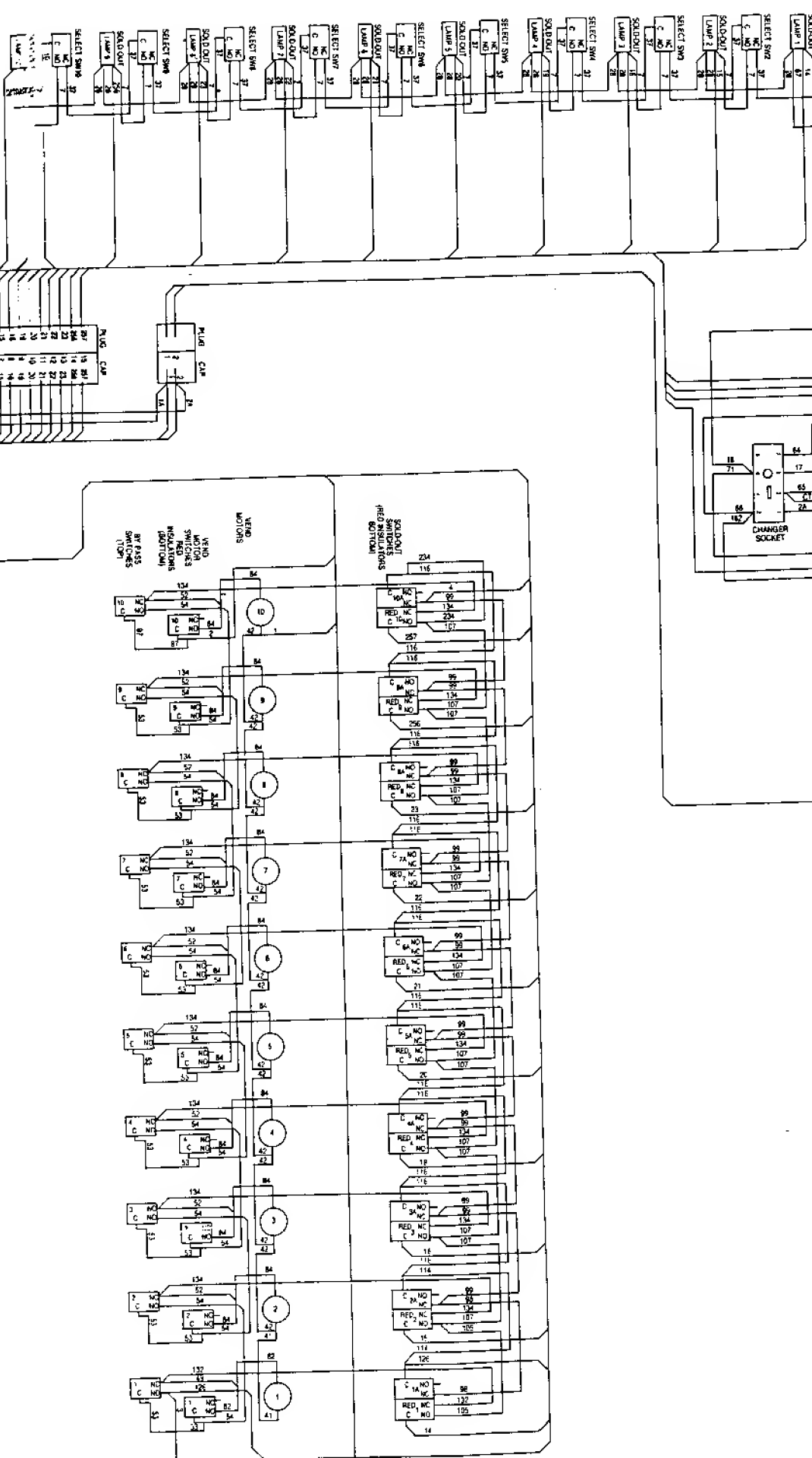
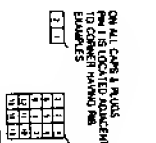
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2,301,256  
4,028,485  
4,028,487  
4,028,489  
4,294,000  
4,294,001  
4,294,126  
4,294,127



ON ALL CARS & TRUCKS  
70-18 LOCATED ADJACENT  
TO THE MAIN WIRING HARNESS  
EXAMPLES:

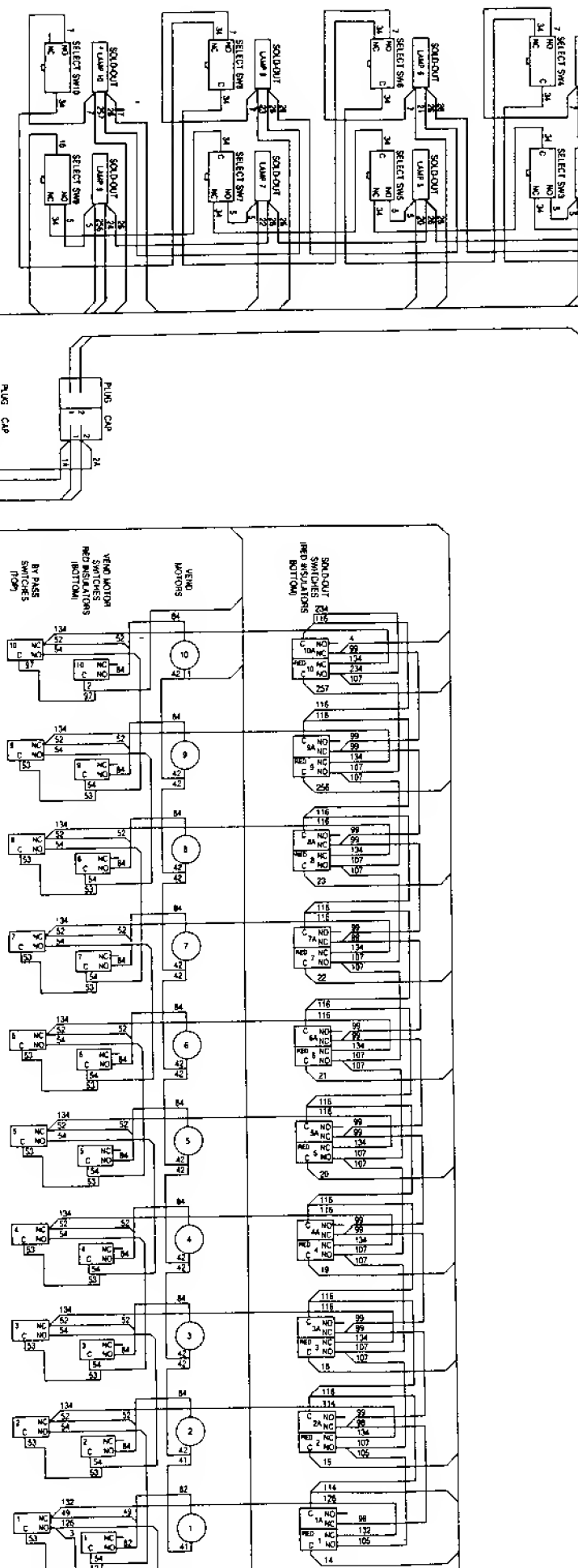
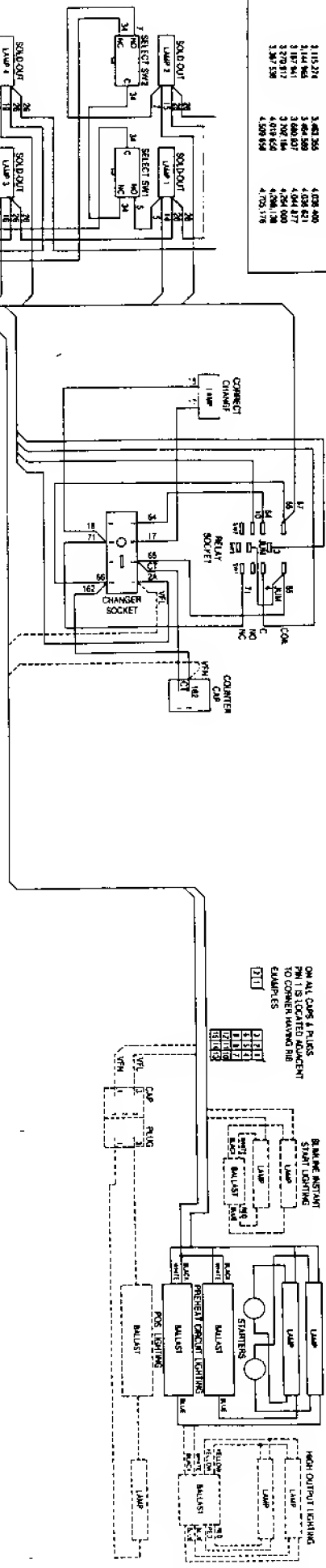
9	8	7	6	5
1	1	1	1	1
1	1	1	1	1

THIS DEVICE IS MANUFACTURED UNDER ONE OR MORE OF THE FOLLOWING U.S. PATENTS:	3,443,355	4,035,400
3,115,774	3,464,545	4,026,643
3,144,564	3,464,546	4,044,877
3,183,901	3,660,313	4,264,000
3,275,917	3,762,341	4,296,139
3,367,546	4,014,650	4,702,176
	4,505,634	



PATENT NOTICE  
THIS DEVICE IS MANUFACTURED UNDER ONE OR MORE OF THE  
FOLLOWING U.S. PATENTS

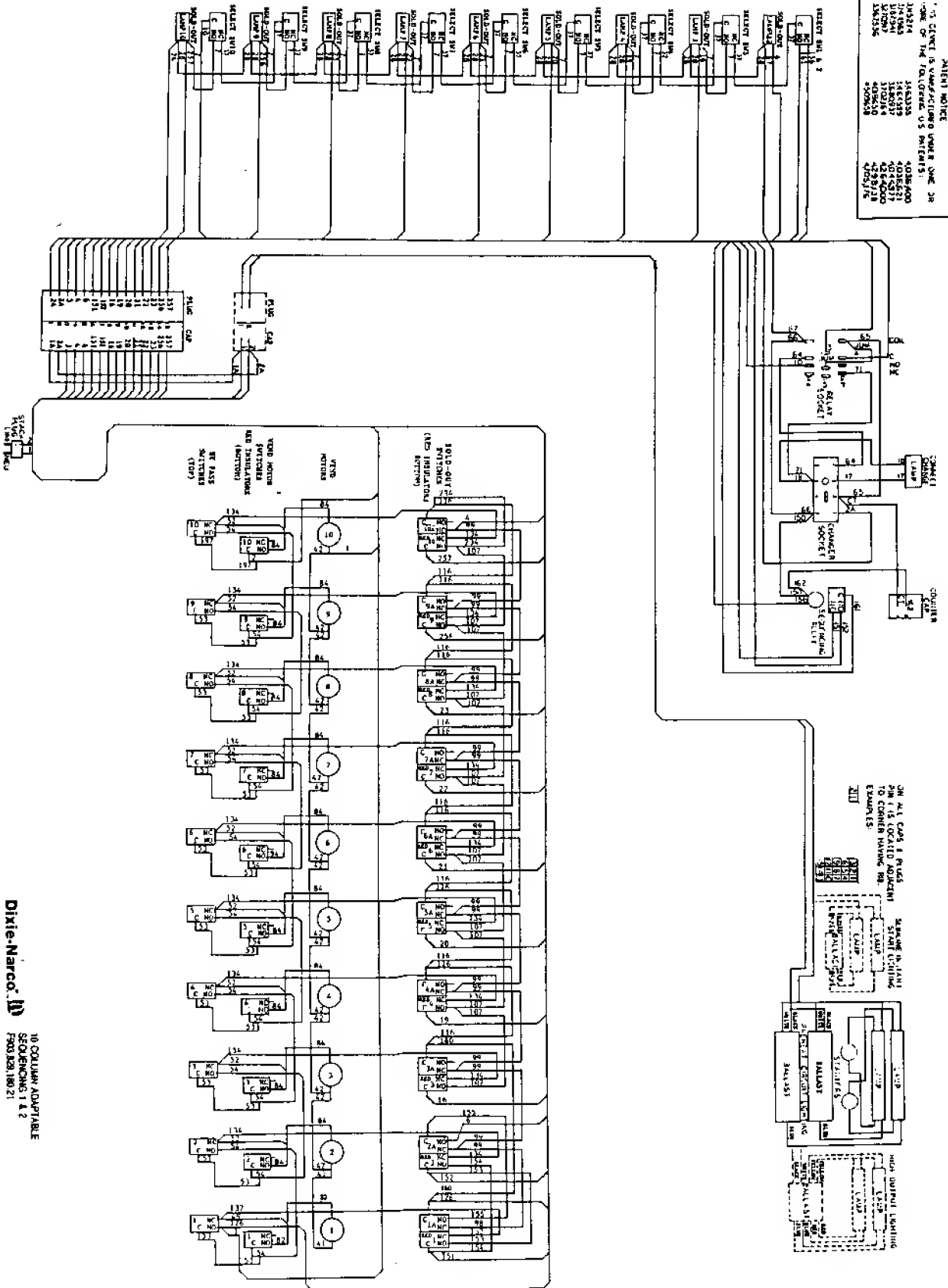
3,115,274	3,422,555	4,028,400
3,144,965	3,444,590	4,030,421
3,187,961	3,580,027	4,040,477
3,212,575	3,612,575	4,050,477
3,247,558	4,018,654	4,060,138
	4,509,844	4,703,176



PATIENT NOTICE

IT IS REQUESTED THAT PATIENTS UNDER CARE OF  
ONE OF THE FOLLOWING U.S. PHYSICIANS:

1035274	5463335	4038400
2183865	5463389	4038621
3013941	5463937	4044817
3102787	5702164	4264000
3535356	4038630	4295128
	4006458	4705176



**Dixie-Marco, Inc.**

10 COLUMN ADAPTABLE  
SEQUENCING 1 & 2  
F903, B29, 180-21

# **GENERAL MAINTENANCE**



# WHAT TO CLEAN

## CABINET

Wash the vender exterior with either soap and warm water or a good detergent and warm water.

Wash all plastic parts with a mild soap and warm water.

**(NOTE: This includes the sign face.)**

The vender should be waxed often with a good grade of automobile wax.

Any corrosion inside the vender should be removed with fine steel wool and the area should be painted with aluminum paint.

Keep the condenser clean.

## COIN ACCEPTOR

Follow the Coin Acceptor Manufacturers instructions.

## REFREGIRATION CONDENSOR

Check the condensor periodically for dirt or lint build up.

Clean the build up with a brush, vacuum, or blow the dirt out of the condensor.

# WHEN AND WHAT TO LUBRICATE

**Every Six Months**  
(or as needed)

Main Door  
1. Lock bolt and nut retainer  
2. Hinge pivot points

Example of lubricants  
Mechanics Friend  
Mechanics Friend

Inner Door  
1. Latch Assembly  
2. Hinge pivot points

Mechanics Friend  
Mechanics Friend

**Every Year**  
(or as needed)

Inner Door  
1. Door gasket

Petroleum Jelly

# THINGS TO ADJUST

## TEMPERATURE CONTROL — All Series 90 Models

This is a "Constant Cut In" type of control which has two (2) adjustments:

They are:

1. The temperature control knob on the outside of the temperature control box.
2. The inside range screws.

**NOTE: The differential screw located between the terminals of the control is sealed and MUST NOT BE CHANGED.**

### AS TO #1 ADJUSTMENT:

(Outside Range). See Fig 1.

The temperature control knob is set in an approximate neutral position. It can be used to make **cut out** temperature colder by turning the knob **clockwise** - or - to make the **cut out** temperature warmer by turning the knob **counter clockwise**. When the knob is used the **cut in** temperature (which governs the defrost) remains **constant**.

### AS TO #2 ADJUSTMENT:

(Inside Range). See Fig. 2.

On the Cutler Hammer temperature control there are two (2) screws provided, one (1) for the **cut in temperature** and one (1) for the **cut out temperature**, both must be adjusted for altitude corrections. For temperature adjustment, turn screws **clockwise** for colder and **counter clockwise** for warmer. When adjusting for temperature **DO NOT TURN** more than 1/8 of a turn at a time. Let the machine run over night before making further adjustment.

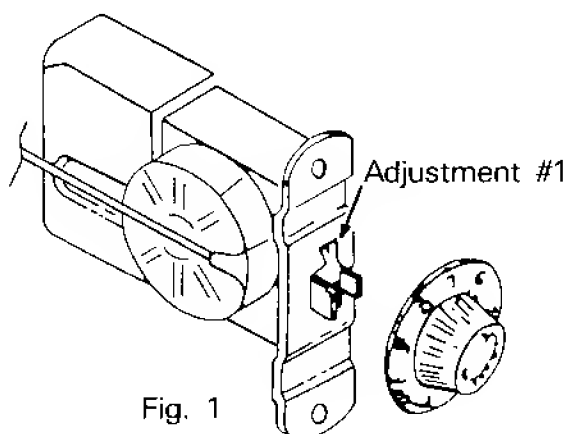


Fig. 1

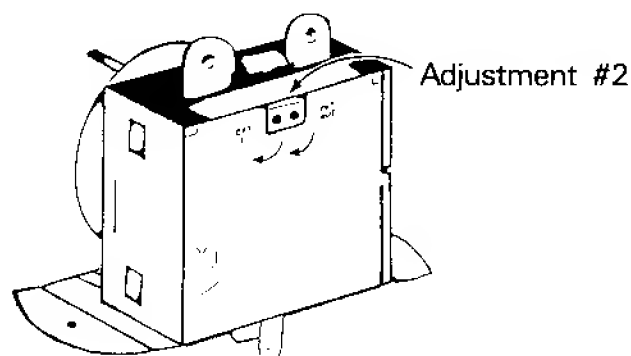


Fig. 2

## TEMPERATURE CONTROL ALTITUDE ADJUSTMENT

The Control is factory set at an altitude of 500 ft. For higher altitudes, the control should be adjusted to prevent freeze-up of product. Adjust the inside range screws as follows:

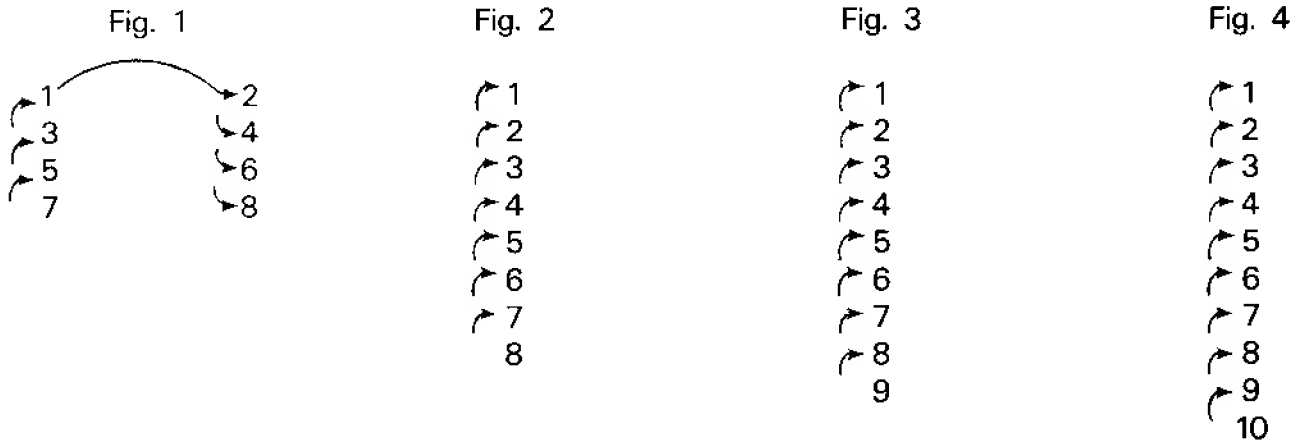
Altitude Feet:	Cutler-Hammer 9531N272 Both Screws Counter-Clockwise
2000	1/8 Turn
4000	1/4 Turn
6000	1/2 Turn
8000	5/8 Turn

# **VENDER TROUBLE SHOOTING**

# HOW TO CORRECT COMMON VENDING TROUBLES

It should be remembered that when one (1) or more circuits become inoperative on a Dixie-Narco Vender that has been operating satisfactorily, it is usually one (1) component that has failed, and it is with this in mind that the accompanying trouble shooting schematic is presented.

Control Panel  
Electrical Feed  
Thru N.C.'s of Each Select Switch



(CONTROL PANEL: Select button and Select Switch Location)

The control panels shown above represent some of the panels used on Dixie-Narco venders.

It is IMPORTANT to keep in mind the feed of electrical current through the select switches.

(Fig. 1)	7, 5, 3, 1, 2, 4, 6, 8 or
(Fig. 2)	8, 7, 6, 5, 4, 3, 2, 1 or
(Fig. 3)	9, 8, 7, 6, 5, 4, 3, 2, 1 or
(Fig. 4)	10, 9, 8, 7, 6, 5, 4, 3, 2, 1

On the inside of the Control Panel, the select buttons and switches are numbered to assist in identifying them. If not numbered, then Push Button arrangement is as shown in (1) one of the foregoing diagrams, i.e., Fig. 1, 2, 3 or 4.

Figures 2, 3 and 4 represent a control panel on which the select buttons are arranged in a vertical pattern and the power feed begins with the highest numbered switch and proceeds to the lowest numbered switch.

Figure 1 represents a control panel on which the select buttons are arranged in a vertical pattern of two rows and the power feed begins with the highest odd numbered switch to the lowest odd numbered switch, then to the lowest even numbered switch to the highest even numbered switch.

## ACCEPTS COINS WILL NOT VEND FROM ONE OR MORE COLUMNS

Although all circuit problems are not necessarily found to be one or more inoperative select switches, the examples listed below are typical of select switch problems found in the control panel. Refer to Fig. 1, page 41.

**PROBLEM 1:** Selection 7 and 5 work.  
Selections 3, 1, 2, 4, 6 and 8 do not work.  
Recall the feed of the electrical current at 7, 5, 3, 1, 2, 4, 6 and 8.

**ANSWER:** Check the N.C. and C. of Select Switch 5.  
Check the N.O. and C. of Select Switch 3.

**PROBLEM 2:** Selection 7 works.  
Selections 5, 3, 1, 2, 4, 6 and 8 do not work.  
Recall the feed of the electrical current.

**ANSWER:** Check the N.C. and C. of Select Switch 7.  
Check the N.O. and C. of Select Switch 5.

**PROBLEM 3:** Selections 7, 5, 3, 1, 2, 4 and 6 work.  
Selection 8 does not work.  
Recall the feed of the electrical current.

**ANSWER:** Check the N.C. and C. of Select Switch 6.  
Check the N.O. and C. of Select Switch 8.

Refer to Figure 2, page 41.

**PROBLEM 4:** Selections 8 and 7 work.  
Selections 6, 5, 4, 3, 2 and 1 do not work.  
Recall the feed of the electrical current.

**ANSWER:** Check the N.C. and C. of Select Switch 7.  
Check the N.O. and C. of Select Switch 6.

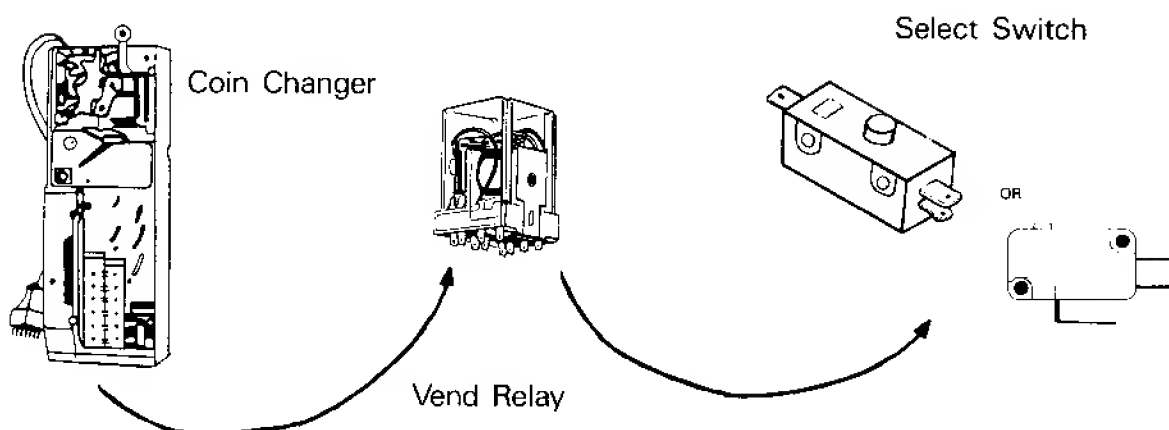
**PROBLEM 5:** Selections 8, 7, 6, 5 and 4 work.  
Selections 3, 2 and 1 do not work.  
Recall the feed of the electrical current.

**ANSWER:** Check the N.C. and C. of Select Switch 4.  
Check the N.O. and C. of Select Switch 3.

## ACCEPTS COINS WILL NOT VEND

**PROBLEM:** All selections do not work.  
Recall the feed of the electrical current.

**ANSWER:** Check the coin changer.  
Check the vend relay.  
Check the select switch that gets power first.



## ACCEPTS COINS WILL NOT VEND FROM ONE COLUMN

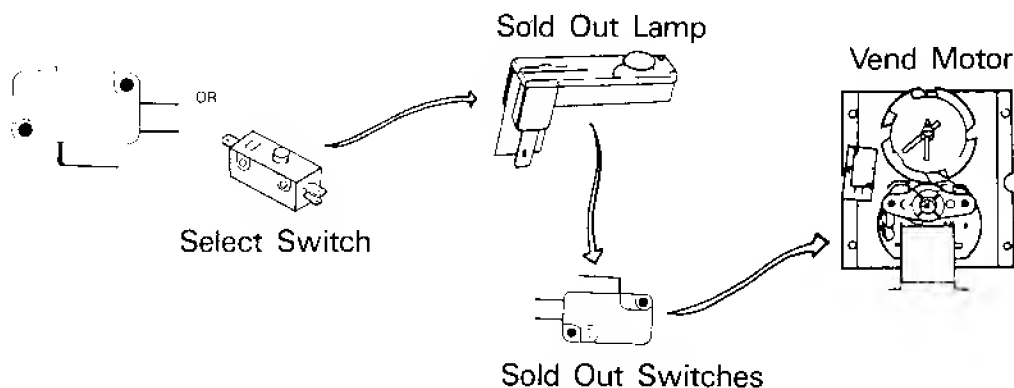
**PROBLEM 1:** Accepts coins but will not vend from one column.

**EXAMPLE:** Selection # 3 will not vend.

**CHECK:** The N.O. of Select Switch #3.  
(NOTE: If the Sold Out Lamp comes on when the button is pushed, the select switch is OK.)

**CHECK:** The Sold Out Switch in the vending circuit.

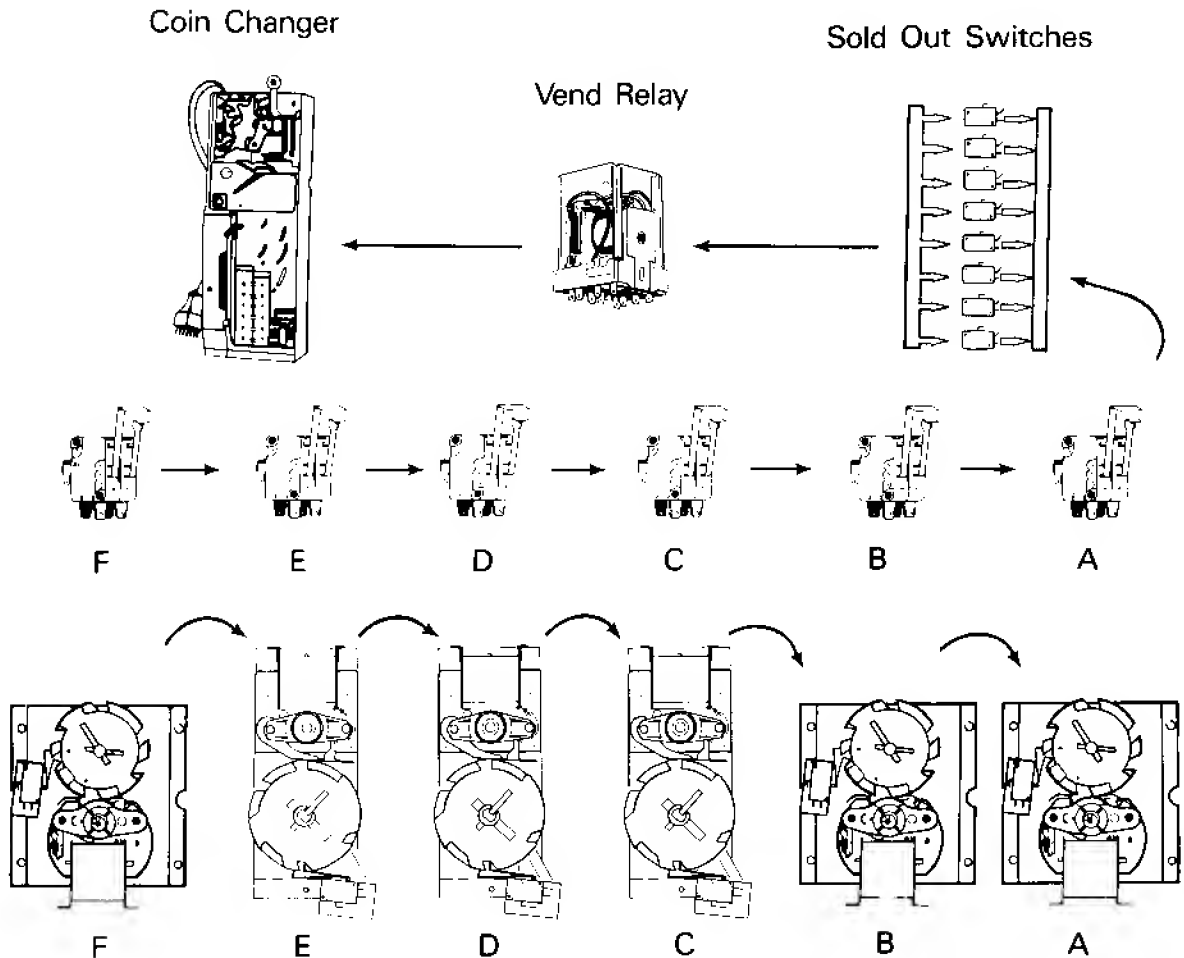
**CHECK:** The Vend Motor.  
(NOTE: If the vend motor runs by depressing the vend switch, the vend motor is OK.)



## REJECTS ALL GOOD COINS

**PROBLEM 2:** The Coin changer will not accept coins.  
Put product in each column.  
Follow the arrow WHICH IS THE DIRECTION OF FLOW OF THE ELECTRICAL  
CURRENT. (See The Figure below)

- DO THIS:**
1. Make sure there is product in each column. The Sold Out Lamps are off.
  2. Follow the arrows from Left to Right.
  3.
    - a. Push Vend Motor Switch - Motor F - Vend Motor cycles.
    - b. Push Vend Motor Switch - Motor E - Vend Motor cycles.
    - c. Push Vend Motor Switch - Motor D - Vend Motor cycles.
    - d. Push Vend Motor Switch - Motor C - Vend Motor does not cycle.  
The Problem is the Vend Motor Switch and By-Pass Switch on Motor C  
and/or  
Motor D.
    - e. If the problem is not found, continue this procedure through Motors B and A.
    - f. If the problem is not found, replace the Vend Relay.
    - g. If the problem is not found, the last component to check would be the coin  
changer.



## DRIFTING MOTOR AND JACK POTTING PROBLEM

SYMPTOM	THINGS TO CHECK	IF FAULTY, WHAT TO DO!
1. The Vend Motor drifts: Both switch arms drop into the Cam Notch and the Vend Motor keeps running.	<p>A. Vend Motor Switch</p> <p>B. Vend Motor Switch Arm relationship to the Cam</p> <p>C. Check the Pawl for looseness. It should be loose.</p> <p>D. Pawl Spring</p> <p>E. Actuator Should be loose.</p> <p>F. Brake clutch - 2 projections on the clutch.</p>	<p>A. Replace the Switch</p> <p>B. If too close to cam, bend the arm away from the cam slightly or replace the switch.</p> <p>C. If tight, replace</p> <p>D. If off, correct If elongated, replace</p> <p>E. If Actuator sticks to stator due to syrup, clean stator. If tight, clean at the pivot. If still tight, replace the motor.</p> <p>F. If broken replace the Vend Motor Assembly</p>
2. Two cans delivered in a given cycle and the next cycle is a dry vend	<p>A. Shimming</p> <p>B. Cam Setting</p>	<p>A. Correct</p> <p>B. Correct</p>
3. Two cans delivered in a given cycle	<p>A. Shimming</p> <p>B. Cam Setting</p> <p>C. Follow checking procedure for a drifting motor.</p>	<p>A. Correct</p> <p>B. Correct</p> <p>C. Correct</p>
4. Pre-Select, i.e., set up credit, push no button and product is vended time after time.	<p>A. Select Switch; Sticking, incorrectly wired, or bad.</p>	<p>A. Replace or Correct</p>



**ACCEPTS COINS AND WILL VEND, THEN  
REJECTS COINS BUT WILL CONTINUE TO FREE VEND**

<b>PROBLEM:</b>	Set up Credit	Push a Selection	It will vend
		Push same Selection	It will vend
	Rejects Coins	Push same Selection	It will continue to vend
<b>REASON:</b>	The Credit is not being canceled by the by-pass switch.		
<b>CHECK:</b>	The By-pass switch electrically	If faulty	Replace
	The By-pass switch for a sticking plunger	If faulty	Replace
	The By-pass switch for incorrect wiring.	If incorrect	Correct
	Set up Credit	Push a Selection Push same Selection	It will vend It does not vend

**IF VENDER TROUBLE SHOOTING PROCEDURES FAIL,  
CONSULT THE DIXIE-NARCO FACTORY SERVICE**

**1-800-688-9090**

**NOTE: Have the vender model # and serial # available.**

# **REFRIGERATION PARTS & FUNCTIONS**

# **REFRIGERATION PARTS AND FUNCTIONS**

## **— MECHANICAL PARTS —**

### **COMPRESSOR MOTOR**

The compressor motor (sealed in the compressor housing) drives the compressor with a shaft that is shared by both parts. It is started by the temperature control switch, the starting relay and the thermal overload switch. It is stopped by the temperature control switch, and, if it gets overloaded, by the thermal overload switch.

### **COMPRESSOR**

The compressor (sealed in the compressor housing) draws cold, low pressure freon gas from the evaporator and pumps hot, high pressure freon gas out to the condenser.

### **CONDENSER**

The condenser, located in the base of the vender, at the front, takes heat out of the hot, high pressure gas that comes from the compressor. The gas loses heat as it goes through the condenser coils, and changes into a liquid because it is still under pressure.

### **CONDENSER FAN**

The condenser fan (between the condenser and the compressor motor), first draws air from the outside of the vender through the condenser. This air takes heat from the condenser first and then is blown over the compressor housing from which it also takes heat before going back outside of the vender. The condenser fan runs when the compressor motor runs.

### **FILTER/DRYER**

The filter/dryer is in the liquid line between the condenser and the capillary tube. This dryer filters out any foreign particulate matter and also contains a desiccant to absorb any moisture that may be present in the system.

### **CAPILLARY TUBE**

The capillary tube (between the condenser and the evaporator in the refrigerant line) has a very small inside diameter, and serves to control the refrigerant flow from the condenser into the evaporator.

### **EVAPORATOR**

The evaporator (in the vender cabinet) takes heat from the air in the vender cabinet and gives this heat to the liquid refrigerant. The liquid refrigerant is evaporated (boiled off) as a gas, and the gas is drawn out by the compressor.

### **EVAPORATOR FAN**

The evaporator fan draws warm air from around the cans or bottles in the cooling compartment and blows it across the evaporator. As the air goes across the evaporator, it gives up heat to the evaporator, then goes back to the cans or bottles, and takes heat from them. This fan runs continuously when the vender is plugged in.

### **CONDENSATE PAN**

The condensate pan (located in the compressor compartment) collects the water which runs from the evaporator. The water is evaporated into the surrounding air by means of soakers. The soakers extend down into the pan to absorb the water. Exposure to the surrounding air vaporizes the water in the soakers.

## — ELECTRICAL PARTS —

### TEMPERATURE CONTROL

The temperature control is the part that is made up of a control bulb connected by a small metal tube to a bellows. The control bulb is in a slot in the evaporator fan housing. The bellows and a switch known as the temperature control switch, are in the temperature control box which is fastened to the right side inside the vender.

The control bulb and the bellows have a vapor in them. When the temperature of the vapor in the bulb rises, it builds up pressure in the bellows tube. This pushes the bellows out. When the control bulb is cool, the vapor shrinks back, and the bellows pulls in. These movements of the bellows work the switch - called the temperature control switch - closing it when the bulb is heated and opening it when the bulb is cooled.

The contacts of the temperature control switch are in the compressor motor's running and starting circuits. They are also in the condenser fan motor circuit.

When the cabinet temperature gets up to the cut-on setting, the temperature control switch closes in the compressor motor's starting and running circuits and in the condenser fan circuit. When the cabinet temperature gets down to the cut-off setting, the temperature control switch opens in these circuits.

**CAUTION:** To adjust temperature control see "Things to Adjust," page 40.

### THERMAL OVERLOAD ASSEMBLY

The thermal overload is a temperature activated switch that interrupts power to the compressor when excessive temperatures occur. This switch protects the compressor from the damage that will occur if the compressor continues to operate under adverse conditions. The overload also opens under abnormally high amp draws, protecting the motor windings from damage. Frequent overload trips may lead to warm product and be the first indication of a dirty condenser or other refrigeration related problems that require attention.

### STARTING RELAY

The starting relay is a device that connects the start winding of the compressor during start up. The additional winding (start) helps the compressor motor come up to speed. Once it reaches speed the starting relay disconnects the start winding from the circuit.

## — ELECTRICAL OPERATION —

WHAT DOES IT	WHAT HAPPENS
<b>WHEN THE VENDER TEMPERATURE GETS UP TO THE CUT-ON SETTING</b>	
The temperature control switch	Closes the run winding circuit of the compressor motor. Closes the start relay coil circuit. Closes in the condenser fan motor circuit.
<b>THE HEAVY CURRENT, DRAWN BY THE RUN WINDING, ALSO FLOWS IN THE START RELAY COIL, AND:</b>	
The start relay coil	Closes the start relay contacts and completes the start winding circuit of the compressor motor.
<b>WHEN THE COMPRESSOR MOTOR GETS UP TO SPEED</b>	
The spring in the relay	Pushes the start relay contacts apart because
The start relay coil	No longer gets enough current to hold the contacts closed,
The start relay contacts	Open in the start winding circuit of the compressor motor.
<b>IF THE COMPRESSOR MOTOR DRAWS TOO MUCH CURRENT AND CAUSES THE THERMAL OVERLOAD ASSEMBLY TO GET TOO WARM</b>	
The thermal overload switch	Opens the run winding circuit and disconnects the compressor motor.
<b>WHEN THE THERMAL OVERLOAD ASSEMBLY COOLS DOWN AGAIN</b>	
The thermal overload switch	Closes the run winding circuit and the start relay coil circuit of the compressor motor.
<b>WHEN THE VENDER TEMPERATURE GETS DOWN TO THE CUT-OFF SETTING</b>	
The temperature control switch	Opens in the run winding circuit of the compressor motor. Opens in the starting relay coil circuit.

## — ELECTRIC CIRCUITS AND CIRCUIT DIAGRAMS —

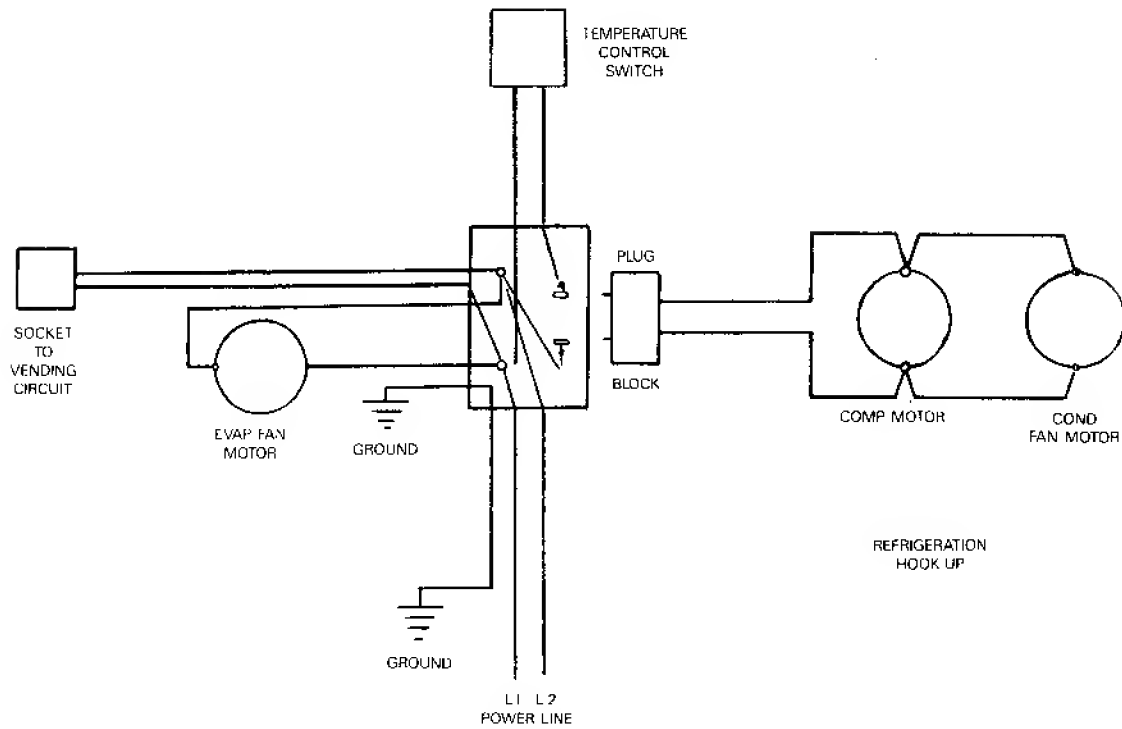
### CONDENSER FAN CIRCUIT

SWITCHES IN THE WIRING	WHAT THE SWITCHES DO	WHAT MAKES THE SWITCHES WORK
Temperature control switch	Turn the condenser fan motor on and off	The temperature in the vender has come up to the cut-on point (or gotten down to the cut-off point) set on the temperature control.

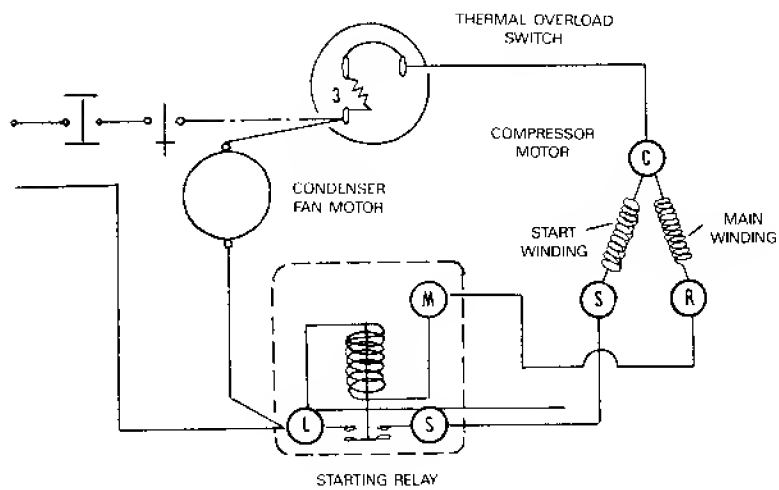
### COMPRESSOR MOTOR RUN WINDING CIRCUIT

SWITCHES IN THE WIRING	WHAT THE SWITCHES DO	WHAT MAKES THE SWITCHES WORK
1. Temperature control switch	1. Turns the compressor motor on and off.	1. The temperature in the vender has come up to the cut on point (or got down to the cut off point) set on the temperature control switch.
2. Start relay	2. Turns the start windings on and off.	2. The presence or absence of heavy current switches the relay which energizes or de-energizes the start windings.
3. Thermal over-load switch	3. Turns the run windings of the compressor motor on.	3. Current drawn by the motor or heat from the compressor can raise the temperatue of the thermal overload assembly and make the thermal overload switch cut off. Which removes power from the compressor.

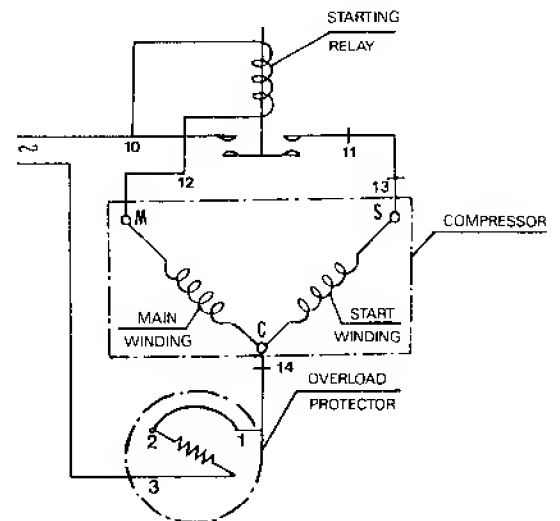
# REFRIGERATION CIRCUIT DIAGRAMS



**Techumseh**



**Embraco**



# **REFRIGERATION CYCLE**

# REFRIGERATION CYCLE

WHAT DOES IT	WHAT HAPPENS
The rising temperature in the vender	Warms the temperature control bulb and the charge in it
The charge in the control bulb	Expands in the control tube and stretches the temperature control bellows.
The bellows	Activates the temperature control switch
The temperature control switch	Turns the compressor motor on. Turns the condenser fan motor on.
The compressor motor	Drives the compressor.
The condenser fan motor	Drives the condenser fan. Draws air through the condensor, cooling it and pushes air over the compressor, cooling it.
The compressor	Draws low pressure refrigerant gas from the evaporator, compresses the gas, and pumps it to the condenser.
The condenser	Takes the heat out of the high pressure refrigerant gas.
The cooled gas	Condenses into liquid refrigerant
More hot gas coming from the compressor	Pushes the liquid refrigerant into the capillary tube.
The capillary tube	Controls the flow of liquid refrigerant into the evaporator.
The evaporator	(Where the pressure is kept low by the suction of the compressor) transfers heat from the air to the liquid refrigerant.
The liquid refrigerant	Changes into gas at low pressure and is drawn into the compressor.
The falling temperature in the vender	Cools the temperature control bulb and the charge in it to a pre-determined temperature.
The charge in the control bulb	Shrinks, and lets the temperature control bellows pull back.
The bellows	Move, and open the temperature control switch.
The temperature control switch	Turns the compressor motor off. Turns the condenser fan motor off.
The compressor	Stops.
The condenser fan motor	Stops.

(With the vender "Plugged In" the evaporator fan motor runs constantly.)



# **HOW TO TAKE CARE OF THE REFRIGERATION SYSTEM**

## **WHAT TO CLEAN**

Carefully clean dirt and lint from the condenser with a brush, vacuum cleaner or compressed air.

## **WHEN AND WHAT TO LUBRICATE**

The refrigeration system is hermetically sealed and does not have to be oiled or greased. Enough oil is put into the condenser and evaporator fan motors when they are manufactured to last the life time of the component.

## **CORRECTING TROUBLES**

When the refrigeration system is not working properly, refer to the section called "Correcting Common Refrigeration Troubles" on the following pages. Find your trouble and see what the possible causes are. When you have found the cause of the trouble, either make the adjustment, repair the part or put a new part in, whatever is needed. This table does not list all the possible causes of refrigeration troubles - but it does have all the common causes. If your vender has a trouble that is not shown on the chart, or the trouble is not the result of one of the causes shown on the chart, study the section on "How the Refrigeration Mechanism Works" and you may be able to find out what is wrong and fix it.

# **REFRIGERATION TROUBLE SHOOTING**

# HOW TO CORRECT COMMON REFRIGERATION TROUBLES

## PRODUCT HOT:

Compressor will not run.

page 54

Compressor starts but will not keep running.

page 55

## PRODUCT COLD BUT NOT COLD ENOUGH:

Compressor runs but won't cool product.

page 56

## PRODUCT TOO COLD OR FROZEN:

Compressor runs too long or continuously.

page 57

## NOISY REFRIGERATION UNIT:

Possible causes.

page 57

# Symptom: **PRODUCT HOT**

Possible Cause: **Compressor will not run.**

WHAT TO CHECK	
1. Is the vender plugged in? <b>YES</b>	<b>NO</b> , plug it in.
2. Is the compressor power cord plugged in? <b>YES</b>	<b>NO</b> , plug it in.
3. Is the temperature control on? <b>YES</b>	<b>NO</b> , turn it on.
4. Is the circuit breaker or fuse correct? <b>YES</b>	<b>NO</b> , replace or reset.
5. Is there power at the wall outlet?  <b>YES</b>	<b>NO</b> , consult an electrician.
6. Is the vender power cord good? <b>YES</b>	<b>NO</b> , replace.
7. Is the compressor power cord good? <b>YES</b>	<b>NO</b> , replace.
8. Is the temperature control bulb located properly? <b>YES</b>	<b>NO</b> , correct.
9. Is the temperature control good? <b>YES</b>	<b>NO</b> , replace.
10. Is the thermal overload good? <b>YES</b>	<b>NO</b> , replace.
11. Is the start relay good? <b>YES</b>	<b>NO</b> , replace.
12. Is the compressor good? <b>YES</b>	<b>NO</b> , replace.
13. Consult the Dixie-Narco Factory Service 1-800-688-9090. NOTE: Have the vender Model & Serial number available.	

## Symptom: **PRODUCT HOT**

Possible Cause: **Compressor starts, but will not keep running.**

### WHAT TO CHECK

1. Is the temperature control knob set on its highest setting? <b>YES</b>	<b>NO</b> , adjust the knob to a higher setting.
2. Is the voltage supply between 103V and 127V? <b>YES</b>	<b>NO</b> , consult the power company.
3. Is the condensor clear of obstructions? <b>YES</b>	<b>NO</b> , clear or clean.
4. Is the condensor fan blade turning? <b>YES</b>	<b>NO</b> , free the obstruction or replace the blade if needed.
5. Is the condensor fan motor good? <b>YES</b>	<b>NO</b> , replace.
6. Is the temperature control good? <b>YES</b>	<b>NO</b> , replace.
7. Is the tube from the compressor to condensor free of kinks? <b>YES</b>	<b>NO</b> , repair or replace.
8. Is the capillary tube free of kinks? <b>YES</b>	<b>NO</b> , replace.
9. Is the thermal overload good? <b>YES</b>	<b>NO</b> , replace.
10. Is the start relay good? <b>YES</b>	<b>NO</b> , replace.
11. Consult the Dixie-Narco Factory Service 1-800-688-9090. NOTE: Have the vender Model & Serial number available.	

Symptom: **PRODUCT TOO COLD OR FROZEN**

Possible Cause: **Compressor runs too long or continuously.**

<b>WHAT TO CHECK</b>	
1. Is the temperature control knob set properly? <b>YES</b>	<b>NO</b> , set properly.
2. Is the temperature control bulb located properly? <b>YES</b>	<b>NO</b> , correct.
3. Is the temperature control good? <b>YES</b>	<b>NO</b> , replace.
4. Does the evaporator frost over completely while the system is running?	<b>NO</b> , check for leaks or a low charge.
5. Consult the Dixie-Narco Factory Service 1-800-688-9090. NOTE: Have the vender Model & Serial number available.	

Symptom: **NOISY REFRIGERATION UNIT**

<b>POSSIBLE CAUSES</b>	
1. Are refrigerant lines free of contact with surfaces? <b>YES</b>	<b>NO</b> , correct.
2. Is the condensor fan blade hitting?  <b>YES</b>	<b>NO</b> , free any obstructions or replace the blade if needed.
3. Is the evaporator fan blade hitting?  <b>YES</b>	<b>NO</b> , free any obstructions or replace the blade if needed.
4. Is compressor noisy? <b>YES</b>	<b>NO</b> , replace.
5. Consult the Dixie-Narco Factory Service 1-800-688-9090. NOTE: Have the vender Model & Serial number available.	

**IF REFRIGERATION TROUBLE SHOOTING PROCEDURES FAIL,  
CONSULT THE DIXIE-NARCO FACTORY SERVICE**

**1-800-688-9090**

**NOTE: Have the vender model # and serial # available.**